

**INTERGOVERNMENTAL OCEANOGRAPHIC COMMISSION
(of UNESCO)**

**Twenty-fourth Session of the IOC Committee on International Oceanographic
Data and Information Exchange (IODE-XXIV)
Kuala Lumpur, Malaysia, 28-31 March 2017**

**Action Paper/
Draft Summary Report**

Version 2.0

This document will be the main working document for the 24th Session of the IOC Committee on IODE. It includes (i) the draft introductory text that will be used for the summary report of the Meeting; (ii) (in yellow) the decisions requested from the Committee.

In order to facilitate the writing of the Summary Report the text is using the past tense.

Participants in the Session are requested to carefully read this document as well as other working documents.

Draft recommendations and draft resolutions are not included in this document. Those that are prepared prior to the Session will be included in an annex to this document and distributed during the Session.

Conserve nature: Participants are requested to bring their personal set of documents (electronic or paper) as no printed copies will be available at the venue.

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1. OPENING

1 Ms Cyndy Chandler and Mr Yutaka Michida, Co-Chairs of the IOC Committee on International Oceanographic Data and Information Exchange (IODE) welcomed the participants to the Twenty-fourth Session of the IODE Committee at 09:00 on Tuesday 28 March 2017. Ms Chandler also thanked the members of the Committee for their agreement to use English as the only working language for the Session, taking into account the cost of interpretation and translation.

2 Mr Michida recalled briefly the scientific conference that was held on the previous day, 27 March. **SUMMARY OF OUTCOMES OF SCIENTIFIC CONFERENCE**

3 Ms Chandler then introduced the IODE Achievement Awards ceremony that was held on 27 March 2017. She informed the Committee that awards had been given to (---) in recognition of his/her outstanding contribution to the development of marine information management capacity in Africa, and a posthumous award to Prof Mario Ruivo (Portugal) for his early support in 1987 to the development of ocean data and information management capacity that had led to ODINAFRICA. In this regard The Committee observed a minute of silence to commemorate Prof Ruivo.

4 The meeting was then addressed by the representative of the local host and by the IOC Executive Secretary, Dr Vladimir Ryabinin (20 min). Their addresses are attached as Annex (xxx) to this Report. It was reminded that the formal opening of the Session had been held the previous day, 27 March 2017.

2. ADMINISTRATIVE ARRANGEMENTS

2.1 ADOPTION OF THE AGENDA

5 The Committee was invited by the Technical Secretary, Mr Peter Pissierssens, to review and adopt the provisional agenda (**Document IOC/IODE-XXIV/1 prov.**) available from the web site on http://www.iode.org/index.php?option=com_oe&task=viewEventAgenda&eventID=1879. The Committee was requested to note that all working documents were made available only as on-line documents. Any new items or issues proposed by the Meeting were noted here and discussed either under the related Agenda Item or under Agenda Item 9.

6 **ACTION: review and adopt Agenda.**

2.2 DESIGNATION OF A RAPPORTEUR

7 Mr Pissierssens invited the Committee to elect a Rapporteur for the Session. It was recalled that for the past four sessions the Secretariat was tasked to report on the meeting and that no rapporteur was used.

8 **ACTION: elect Rapporteur if needed**

2.3 SESSION TIME TABLE AND DOCUMENTATION

9 The Committee was invited to review and adopt the Timetable (**Document IOC/IODE-XXIV/1 Add. Prov.**)

10 The IODE Technical Secretary (Mr Peter Pissierssens) then reviewed the arrangements for the Session and presented **Document IOC/IODE-XXIV/2.3.** (List of Documents) available on line through <http://www.iode.org/iode24>

11 He then informed the Committee about the working hours for the Session and other details relevant to the conduct of the Session. He reminded the Committee that this Session had 3.5 working days (the objective was to close the Session on Friday before lunch time) to deal with the substance of the meeting. Accordingly there would be no time for extensive introductions of agenda items and participants were urged to carefully read the Action Paper and working documents in preparation for the Session.

ACTION: review and adopt Timetable

2.4 ESTABLISHMENT OF SESSIONAL WORKING GROUPS

12 The Technical Secretary invited the Committee to establish sessional working groups. Suggested groups included:

13 (i) Sessional working group on work plan and budget (Tuesday, Wednesday 12h30-14h30 and/or 18h00-20h00;);

14 (ii) sessional working group on the follow up to the IOC audit (agenda item 6.2.1);

15 (iii) sessional working group on the IODE communication and outreach strategy (agenda item 6.3)

16 (iv) sessional working group on IODE's response to SDG-14 (agenda item 3.5.2.2)

17 (v) sessional working group on IIOE-2 (agenda item 3.5.6)

18 (vi) sessional working group on the IODE CD implementation plan (agenda item 4.1)

19 In addition the Committee was invited to establish a decision/recommendation committee to review submitted draft decisions and recommendations. This Committee would meet during lunchtime or after 18h00 on Tuesday 28, Wednesday 29 and Thursday 30 March (lunch time).

20 The Technical Secretary reminded the Committee that participants had been invited (by email) to identify the need for additional sessional working groups by email, prior to the Session. He informed the Committee of received suggestions.

21 He reminded the Committee that each Sessional Working Group should nominate a Chair who will report back to the Committee at the time the relevant agenda item is discussed in plenary. In exceptional circumstances the Committee may decide to re-arrange the timetable to accommodate a sessional working group.

22

ACTION: establish sessional working groups and decision/recommendation committee

2.5 LOCAL ARRANGEMENTS

23 Information and guidelines for participants were made available through the IODE-XXIV web pages through <http://www.iode.org/iode24>.

24 The local host representative informed the Committee on local arrangements including social events and possibilities for tourist excursions.

3. REPORT ON THE PAST INTER-SESSIONAL PERIOD (2015-2016)

25 This agenda item was introduced by Ms Cyndy Chandler, Co-Chair.

3.1 PROGRESS REPORT ON THE IODE-XXIII WORK PLAN

26 This agenda item was introduced by Ms Cyndy Chandler, Co-Chair. She referred to [Document IOC/IODE-XXIV/3.1](#) (Progress Report on the IODE-XXIII Work Plan). She recalled that IODE-XXIII had adopted 4 decisions and 5 recommendations. She noted that the work plan included 72 action items of which 31 were fully implemented, 24 had reported no action, 7 were partially completed and the remaining needed clarification. Ms Chandler requested those responsible for the action item to report further under the relevant agenda item. Regarding the specific activities included in the work plan and budget table (Recommendation IODE-XXIII.5) Ms Chandler reported that 67% of the 2015 activities were implemented, while 75% of the 2016 activities were implemented. Ms Chandler also recalled that the Officers, during their meeting in Oostende, Belgium between 20-22 January 2016 had reviewed progress and had adjusted the work plan and budget to optimize implementation. The report of the 2016 IODE Officers meeting was available as [Document IOC/IODE-Off-2016/3](#).

ACTION: The Committee is invited to comment on the status and rate of implementation of the IODE-XXIII work plan and budget.

27

3.2 REPORTS OF THE IODE GROUPS OF EXPERTS

28 This agenda item was introduced by Ms Cyndy Chandler, Co-Chair. She recalled that IODE-XXIII had discussed abolishing two Groups of Experts (GE-BICH and GE-OBIS), leaving two: The JCOMM/IODE Expert Team on Data Management Practices (ETDMP) and the IODE/IAMSLIC Group of Experts on Marine Information Management (GE-MIM). As these Groups are joint groups with other Organizations it was noted that they cannot be abolished without agreement of the other Partner. It was noted further that the future of the Groups of Experts would also be discussed under agenda item 6.1.

29 Ms Chandler invited the Chairs of the Groups of Experts to report. She noted that the approval of any proposed work plan and budget would be dependent on the proposed future of the Groups of Experts.

30 Ms Chandler also recalled that the previous Sessions had discussed the abolishing of the GE-BICH and GE-OBIS but had not done so formally.

31 **The Committee decided to formally abolish the IODE GE-BICH and IODE GE-OBIS.**

3.2.1 JCOMM/IODE Expert Team on Data Management Practices (ETDMP)

32 This agenda item was introduced by Dr Sergey Belov, Chair JCOMM/IODE ETDMP. He referred to [Document IOC/IODE-XXIV/3.2.1](#). He also referred to agenda item 6.1 regarding the possible abolishing of the Group.

33 Dr Belov explained that the Joint IOC/IODE Expert Team on Data Management Practices focuses on adopting or developing principles and practices for the end-to-end data management processes, also including required data management best practices and standards for such subjects as metadata, common codes, vocabularies, etc. These data practices include tools and services developed under IODE projects such as Ocean Data Portal, Ocean Data Standards and Best Practices Project (ODSBP), OceanExpert, OBIS. ETDMP also assists the development of tools and services within Ocean Data Portal project to serve better for the development of distributed data network according to the end-to-end data managing principles, including data provider and end-user levels. ETDMP also investigates and proposes adoption of internationally endorsed metadata standards.

34 Dr. Belov informed that during the last inter-sessional period the Group continued to review submitted proposals for ODSBP; established connections with potential new data providers (projects, programmes and other communities) such as WMO WIS, GOOS, EMODNet, GEOSS, etc.; developed the document on interoperability and migration of the ODP metadata into the ISO 19139 encoding; assessed contributions from existing data providers; provided delivery and support for ODINAFRICA ODP regional node established in KMFRI (Kenya); continued coordination of Partnership Centre activities to support and update existing ODP regional nodes (SNDM, ODINWESTPAC) and ODP global node; compiled a list of new standards of metadata and netCDF data templates.

35

ACTION: The Committee is requested to:

(i) acknowledge the accomplishments of the JCOMM/IODE Expert Team on Data Management Practices (ETDMP).

(ii) consider whether the ETDMP should be continued as a joint JCOMM/IODE body or should be abolished. In the latter case the Committee will be requested to formulate a [Recommendation](#) to JCOMM.

If the Committee prefers to maintain the ETDMP then:

- The Committee is requested to invite member states to actively liaise with JCOMM/IODE ETDMP on standards and best practices, metadata management and the exchange of data, information and services.

- The Committee is requested to approve the funds requested for the 6th ETDMP Session in 2018.

3.2.2 IODE/IAMSLIC Group of Experts on Marine Information Management (GE-MIM)

36 This agenda item was introduced by Ms Linda Pikula, Chair IODE/IAMSLIC/GE-MIM. She referred to [Document IOC/IODE-XXIV/3.2.2](#). She also made reference to the work of the inter-sessional working group to propose a re-structuring of IODE (agenda item 6.1) in general and to the proposed creation of "Associate

Information Units” as a new IODE structural element (see agenda item 6.1.1).

37 Ms. Pikula recalled that GEMIM was formally established through IODE-XI, New York, 9-18 January 1984, Recommendation XI.4 and subsequently modified to the Joint IODE/IAMSLIC GEMIM established by IODE-XXII, 2013 Recommendation MIM-XXII.1.

38 She recalled that the objective to this Group of Experts in Marine Information Management is to:

- (i) Advocate marine information managers as essential partners in the knowledge cycle that includes observation, management, sharing and product/service provision contributing to the marine related decision making process;
- (ii) Advise the IODE Committee on the policy, development and further implementation of an effective international system for scientific and technical information about the marine environment by keeping user requirements under continuing review and ensuring that these requirements can be met adequately;
- (iii) Identify the policy, technical and financial issues involved in the development and implementation of marine information systems, and make recommendations concerning their solution;
- (iv) Develop activities and information products to improve the capability of the marine information management community, particularly within developing countries, to benefit from and participate in marine information systems and keep the marine information management community informed on how they might best have access to such systems through the application of new technology.

39 Ms Pikula also referred to the report of the Inter-sessional working Group to Propose a Re-structuring of IODE (Decision IODE-XXIII.1).

ACTION: The Committee is requested to consider whether the GE-MIM should be maintained or abolished. In this regard the Committee will be reminded that the GE-MIM is a joint IAMSLIC/IODE group. If the Committee wishes to abolish the Group then the Committee will be requested to formulate a Recommendation to IAMSLIC.

40

3.3 STATUS OF THE IODE NETWORK

41 This agenda item was introduced by Ms Cyndy Chandler, Co-Chair referring to [Document IOC/IODE-XXIV/3.3.1.a](#) (Status of the IODE Network: Part 1: Data Management) and [Document IOC/IODE-XXIV/3.3.1.b](#). (Status of the IODE Network: Part 2: Marine Information Management).

42 She recalled that IODE-XXII had adopted, through [Recommendation IODE-XXII.17](#) three structural elements of IODE: (i) National Oceanographic Data Centre (NODC); (ii) IODE Associate Data Unit (ADU); and IODE Global Data Assembly Centre (IODE GDAC).

43 She reported that the IODE network currently (December 2016) includes 63 National Oceanographic Data Centres and 20 Associate Data Units. No GDACs have been established so far. She noted that the IOC currently has 148 Member States.

44 She recalled that two NODCs were accredited by IODE-XXIII (China and Belgium). No new applications for accreditation were received during the inter-

sessional period.

45 The following 6 ADUs were added during the inter-sessional period: (i) Marine Science Centre, University of Basrah, Iraq (2015); (ii) Oceans Past Initiative, Lisbon, Portugal (July 2015); (iii) Parques Nacionales Naturales de Colombia, Bogota, Colombia (October 2015); (iv) Fundación Universidad de Bogota Jorge Tadeo Lozano, Magdalena, Colombia (October 2015); (v) Marine and Coastal Research Institute (INVEMAR), Santa Marta, Colombia (October 2015); (vi) Conservation of Arctic Flora and Fauna (CAFF), Akureyri, Iceland (October 2015).

46 Ms Chandler informed the Committee that it had been decided by the IODE Officers to use an online survey to obtain reports from NODCs, ADUs and marine librarians, as had been done for 2007-2008, 2009-2010 and 2011-2012. The survey was opened on 21 September 2016 and closed on 21 October 2016. The aforementioned working documents summarized the results of the two Surveys.

47 [CONCLUSIONS BY CO-CHAIRS]

48 Ms Chandler recalled that no GDACs had been established during the inter-sessional period. She noted that there appeared to be some confusion regarding the terms of reference of the IODE GDACs (as documented in Recommendation IODE-XXII.13 and those of the JCOMM GDACs. Several experts had requested that IODE and JCOMM should harmonize the terms of reference in order to avoid further confusion which had hampered formal applications to become a GDAC.

ACTION: The Committee is requested to:

- (i) compare the IODE and JCOMM GDAC terms of reference with the objective to harmonize them.
- (ii) formulate a **Recommendation** to re-define the TORs of an IODE GDAC.

49

3.3.1 RENEWAL OF THE MOU BETWEEN THE FLANDERS MARINE INSTITUTE AND IOC REGARDING THE IOC PROJECT OFFICE FOR IODE

50 This agenda item was introduced by Mr Peter Pissierssens, Head of the IOC Project Office for IODE, referring to [Document IOC/IODE-XXIV/3.3.1c](#).

51 He recalled that the first MoU between UNESCO/IOC and the Flanders Marine Institute regarding the UNESCO/IOC Project Office was signed on 19 December 2005. The establishment of the Office was formally approved by the Twenty-second Session of the IOC Assembly through Resolution XXII-7. The Terms of Reference (Article I) of the Office were defined as follows: (i) to establish a creative environment facilitating the further development and maintenance of IODE projects, services and products with emphasis on improving the efficiency and effectiveness of the data and product/service stream between the stage of sampling and the user; (ii) to assist in strengthening the capacity of Member States to manage oceanographic data and information (by organizing relevant training and the capacity building related activities) and to provide ocean data and information products and services required by users; (iii) to liaise and maintain links with relevant UNESCO/IOC programmes and other projects as relevant to the projects implemented by the UNESCO/IOC Project Office for IODE; (iv) to establish and maintain links with other relevant organizations, institutions and programmes in order to promote cooperation with the UNESCO/IOC Project Office for IODE. The initial agreement had a duration of four years (1 January 2006 – 31 December 2009) but this term was in fact extended up to 30 April 2012. The second MoU was established covering the period 1 May 2012 to

31 December 2016. Under this agreement VLIZ contributed: (i) offices, meeting and conference rooms with an approximate floor space of not less than 1100 m²; (ii) the cost of utilities (water, power, heating, cooling); (iii) use of a permanent internet connection (broadband, >100 Mb/s upload and download); (iv) the cost of taxes levied on the physical facilities; (v) the cost of maintenance and fire insurance of the building/offices and their content; (vi) an annual financial contribution of not less than €250,000 to be used as a contribution towards the operational expenses and programme activities of the Project Office. The actual annual financial contribution will depend upon the approval of the budget of the Government of Flanders and budget of VLIZ; (vii) not less than three staff FTE who will be made available to the project office through a non-reimbursable loan agreement or equivalent arrangement; and (viii) in-kind technical assistance for the management of the main internet connection (see iii), firewall and servers.

52 In Article V of the 2012-2016 MoU is stated that “An independent performance evaluation of the UNESCO/IOC Project Office for IODE shall be organized once, jointly by UNESCO/IOC and prior to the expiry of this Memorandum of Understanding. The evaluation shall be submitted for approval to the IODE Committee that oversees the Project Office activities. The Committee may, as it deems necessary, recommend the renewal or extension of this agreement and will submit this Recommendation to the next available Session of the IOC Assembly of Executive Council”.

53 In June 2016 an assessment was prepared of the performance of the Project Office since its establishment in 2005 (IOC Project Office for IODE: towards a new MoU). This has been combined with elements of the “Impact analysis of VLIZ with focus on the period 2009-2013” commissioned by VLIZ from IDEA consult (2015). These have been combined in the working document IOC/IODE-XXIV/3.1.3.

54 Mr Pissierssens then informed the Committee on recent developments regarding the support by the Government of Flanders to the Project Office.

ACTION: The Committee is requested to:

- (i) Consider the analysis of performance contained in Document IOC/IODE-XXIV/3.3.1c**
- (ii) Recommend the renewal of the MoU between IOC and VLIZ (on behalf of the Flemish Government) regarding the IOC Project Office for IODE [Recommendation]**

55

3.4 PROGRESS REPORTS OF GLOBAL PROJECTS

56 This agenda item was introduced by Prof Yutaka Michida, Co-Chair. He recalled that during the past few Sessions the Committee, as part of its re-organization and abolishing of the Groups of Experts has gradually transformed most IODE activities into projects in order to arrive at a more results focused programme where results can be measured and evaluated. Each project, with clear terms of reference, should be managed by a Steering Group with one or two (Co-) Chairs designated by the Steering Group. Some projects may also designate project coordinators and/or technical managers. All member states are welcome to participate in the work of Projects and their Steering Groups. He noted that while projects usually have a starting and ending date, many of IODE's projects have been on-going for many years and possibly the Committee should consider whether all current projects should continue indefinitely or whether end dates should be identified. In addition projects that should continue may need to be renamed to reflect their permanent character. In this regard reference was made to the work of the inter-

sessional working group to propose a re-structuring of IODE (agenda item 6.1).

- 57 Prof Michida then invited all IODE project Steering Group Chairs to present a brief report on key results and outputs prepared during the past inter-sessional period and to introduce a concise work plan for the next inter-sessional period. He noted that requested budgets would be considered by the sessional working group for work plan and budget taking into account confirmed revenue from the UNESCO regular programme and extra-budgetary sources. In this regard he referred to agenda item 7. Finally Prof Michida requested each presenter to limit his or her presentation to 5 minutes. He also informed the Committee that after each presentation there would be 5 minutes for questions.

3.4.1 Ocean Biogeographic Information System

- 58 This agenda item was introduced by Dr Eduardo Klein, Chair of the IODE Steering Group for the OBIS project. He referred to [Document IOC/IODE-XXIV/3.4.1](#) (which includes the annex: OBIS Node Health Status Check and Transition Strategy).

- 59 He recalled that the overall objective of the project is to be the most comprehensive gateway to the world's ocean biodiversity and biogeographic data and information required to address pressing coastal and world ocean concerns.

- 60 He reported that the following activities had been implemented during the intersessional period: (i) Two sessions of the SG-OBIS were held (SG-OBIS-V, May 2016 and SG-OBIS-VI, Feb 2017); (ii) SG-OBIS co-chair Bruno Danis retired and Sky Bristol (USGS/OBIS-USA) was appointed as the new SG-OBIS co-chair at SG-OBIS-V; (iii) The new OBIS Executive Committee (composed of the SG-OBIS co-chairs, the OBIS secretariat and the chairs of the OBIS task teams) met for the first time (November 2016); (iv) a cooperation agreement was signed with the Biology & Ecosystems panel of GOOS and the Marine Biodiversity Observation Network (MBON) of GEO BON in December 2016; (v) four new OBIS nodes were established; (vi) almost 5 million new records were added to OBIS and OBIS is cited in 192 scientific papers; (vii) OBIS data is used in 3 chapters of the UN World Ocean Assessment and get its first reference in the UN General Assembly Resolution for its contribution the Marine Scientific Research; (viii) new OBIS QC tools and OBIS products (e.g. biodiversity indicators) are under development and will support the implementation of the new OBIS-ENV-DATA standard which is published in the Biodiversity Data Journal (January 2017); (ix) the major focus for the next period will be on building capacity (training the IODE-OBIS network) as well as re-engineering the OBIS infrastructure and technology stack to increase OBIS performance and respond to new and increased requirements and mandates. (x) Those new challenges and increased expectations of OBIS are posing a scalability risk upon OBIS and any new requirements or mandates will need to come with extra resources for the IODE-OBIS network as well as for the central operations.

- 61 We thank the (i) in-kind contributions to core OBIS operations such as those from the Flanders Marine Institute, especially the support on resolving taxonomic name issues by the data management team of the World Register of Marine Species, as well as (ii) JAMSTEC/GODAC for hosting the 6th session of the IODE Steering Group for OBIS and (iii) the generous private donation from Serge Martin to the OBIS special account.

- 62 We also thank the OBIS-ENV-DATA pilot project for their excellent work done on the proposed OBIS-ENV-DATA standard for combined biological, environmental, and sampling methodology, published in the Biodiversity Data Journal: <https://doi.org/10.3897/BDJ.5.e10989> .

- 63 We also welcome the decision of the 193 Parties to the Convention on

Biological Diversity (Decision COPXIII/12, December 2016), which requested the CBD to (i) establish a partnership with OBIS to facilitate training opportunities for incorporating new information and new consideration of existing information in future description of areas meeting the EBSA criteria, including both scientific and traditional knowledge and (ii) provide links from the EBSA repository to the data and information from EBSA areas in OBIS.

ACTION: the Committee is requested to:

- (i) approve the OBIS Node health status check and transition strategy for inactive OBIS nodes.**
- (ii) discuss progress and to approve the work plan and budget for the next intersessional period**
- (iii) endorse the OBIS Event Data for Scientific Applications IODE pilot project proposal and support the full and timely implementation of the OBIS-ENV-DATA standard through providing the necessary resources for workshops and trainings.**

64

3.4.1.1 IODE Pilot Project Expanding OBIS with environmental data (OBIS-ENV-DATA Pilot Project)

65 This agenda item was introduced by Mr Francisco Hernandez, Chair of the IODE Steering Group for OBIS-ENV-DATA. He referred to [Document IOC/IODE-XXIV/3.4.1.1b](#).

66 Through the two-year IODE pilot project: OBIS-ENV-DATA (Recommendation IODE-XXIII.4, in 2015) a proposed standard and technological solution has been developed for the publication of combined biological and environmental datasets. This is the result of a workshop held at the IODE project office in Oostende on 5-7 October 2015, and subsequent discussion, design, issue resolution, and technical development. The pilot project involved an international network of 11 institutions from 10 countries in North America, South America, Europe, Africa and Oceania.

67 The proposed standard consists of a DarwinCore (Dwc) Event Core in combination with a DwC Occurrence Extension and a proposed enhancement to the DwC MeasurementOrFact Extension. This new structure enables the linkage of measurements or facts - quantitative and qualitative properties - to both sampling events and species occurrences, and includes additional fields for property standardization (using the NERC Vocabulary). The standard also allows to organize, aggregate, and link ocean observation events using "event hierarchy".

68 An open-access paper (<https://doi.org/10.3897/BDJ.5.e10989>) is published on 9 January 2017 and describes the OBIS-ENV-DATA pilot project evaluation and decision of the proposed standard among other alternatives. The paper provides examples for data from CTDs and Niskin bottles, Animal Telemetry and a video plankton recorder.

69 The proposed standard has already been brought into production by GBIF. In addition, OBIS has already adapted its harvesting procedures. Finally, all technical aspects and best practices of the standard have to be defined in detail and made available as guidelines in the online OBIS manual (jobis.org/manual), which will then be submitted to the IODE Ocean Data Standards and Best Practices project for adoption by IODE. Subsequently, the OBIS nodes and IODE data centres need to be trained. In addition, a data flow to specialized regional and global repositories for

abiotic data captured by OBIS could be developed.

70 As the two-year OBIS-ENV-DATA pilot project now ends, Prof Eduardo Klein (OBIS co-chair) introduced the proposal of a new two-year pilot project called “OBIS Event Data for Science Applications, building on the success of OBIS-ENV-DATA, with the aim to validate and enhance the scientific purposes of developing and using OBIS Event Data with the aim to support data and information product development within the framework of GOOS and the Marine Biodiversity Observation Network (MBON) of GEO.

71 Mr Klein invited OBIS nodes, NODCs and ADUs to express their interest in joining this new pilot project. The development of the first data products and applications based on the OBIS Event data standard and the implementation of technology enhancements and tools as part of the core OBIS data system (and dataset) output is co-funded by DIPS-4 ocean assessment (see topic 3.4.1.2) and through in-kind contributions by OBIS nodes. However, other funding sources will also be sought to support this activity. A budget of US\$ 32,000 is requested from IODE for 2 workshops and travel.

ACTION: The Committee is requested to comment on the work achieved and to consider the workplan and budget of the new pilot project proposal: OBIS Event Data for Science Applications (IOC/IODE-XXIV/3.4.1.1.b) – Recommendation to establish new pilot project.

72

3.4.1.2 Development of Information Products and Services for Ocean Assessments (DIPS-4 Ocean Assessments)

73 This agenda item was introduced by Ward Appeltans, project manager DIPS project.

74 Through the DIPS-4-Ocean Assessments (in short DIPS) project (a Flanders' UNESCO Science Trust Fund project), more indicators and products on OBIS data are under development that should support Member States in their reporting obligations on progress towards the Aichi Biodiversity targets. Through DIPS, OBIS also contributes to the 'Global HAB Status Report' (GHSR). GHSR aims to provide an overview of HAB events and their societal impacts; provide a worldwide appraisal of the occurrence of toxin-producing microalgae; and assess the status and probability of change in HAB frequencies, intensities, and range resulting from environmental changes at the local and global scale. The development of this report is intimately linked with the systematic compilation of HAB data in OBIS and the IOC Harmful Algal Event Database (HAEDAT), see agenda item 3.5.2.3.2 HAEDAT).

75 In order to support the creation of new information products several new OBIS data access services have been built throughout the first year, with input from a hackathon event organized in December 2015. The newly developed OBIS R package (<http://github.com/iobis/robis>) and the new OBIS exploration portal (www.iobis.org) both run on the newly developed OBIS RESTful JSON API (<https://github.com/iobis/api-docs>). The R package allows loading OBIS occurrence data and taxon lists directly into the R statistical programming environment for further analysis and the creation of products. The OBIS data exploration portal provides enhanced access to data and statistics related to geographical areas (EEZ, UNESCO World Heritage marine Sites, EBSAs, ABNJ), taxa, institutes and datasets, and could be used by Member States for national biodiversity reporting.

76 The following products have been developed, with support through a contract with the University of Sheffield:

- A tutorial for an R-statistical pipeline to extract and enrich OBIS data with other environmental, geographic, and biological data sets to better understand the distribution and dynamics of marine biodiversity (<http://iobis.org/2016/11/22/sorbycollection/>)
- A proposed new OBIS visualisation of marine species richness, gaps and completeness. Using Belgium as a test case (<http://iobis.org/2016/11/17/completeness/>)
- A proof-of-concept on the application of occupancy modelling to extract robust temporal trends for tracking changes in ocean biodiversity and identifying potentially at risk species (<http://iobis.org/2016/11/15/occmmod/>)

77 Future developments of DIPS-4-Ocean Assessments will include further enhancements of the OBIS exploration portal with inclusion of more statistics (including those listed above) and customized data portals (e.g. HAB, deep-sea, live coral and other GOOS biological and ecosystems EOVs).

ACTION: The Committee is requested to comment on the work achieved.

78

3.4.2 Global Oceanographic Data Archaeology and Rescue Project (GODAR)

79 This agenda item was introduced by Mr Hernan Garcia. It was noted that, contrary to other IODE projects, the GODAR project has not been led by a Steering Group but by one expert (currently Dr Tim Boyer, previously Dr Sydney Levitus). Mr Hernan Garcia referred to [Document IOC/IODE-XXIV/3.4.2.](#)

80 Mr Garcia recalled that the Global Oceanographic Data Archaeology and Rescue (GODAR) project is tasked to identify historic ocean profile data which are not readily available publicly and may be in danger of disappearing from the public record, and adding it to the World Ocean Database (WOD) for preservation and public dissemination. Historic in this context means any data taken more than five years from the present date. The GODAR project added more than 224,000 historic oceanographic profile casts to the WOD over the last two years. These data came in many forms, from digitized original cruise reports from the HMS Challenger cruises of the late 19th century to records of instrumented elephant seals from the still ongoing MEOP (Marine Mammals Exploring the Ocean Pole to Pole) Program. Continued communication with the MEOP program and institutions such as the International Council for the Exploration of the Seas (ICES) has paid off in the addition of many historical data to the WOD.

81 In the next two years GODAR intends to continue and expand communications with oceanographic data centers, as well as research and data programs, to facilitate the continued flow of data from all sources to the WOD.

82 IODE is urged to continue to facilitate this communication and continue to remind member states of the great need to provide historic data in danger of obsolescence to the WOD for sustained availability.

83 The GODAR project will also continue to facilitate and directly execute digitization of oceanographic profile data. GODAR will continue to devote resources to this digitization effort and to work closely with atmospheric and marine meteorological data rescue efforts.

84 IODE is urged to provide funding and expertise to this effort, specifically in the case of recently disclosed historic paper records in Argentina.

ACTION: The Committee is requested to comment on the work achieved and to consider the proposed work plan and budget for the next inter-sessional period.

3.4.3 World Ocean Database (WOD)

This agenda item was introduced by Mr Hernan Garcia. It was noted that, contrary to other IODE projects, the WODB project has not been led by a Steering Group but by one expert (currently Dr Tim Boyer, previously Dr Sydney Levitus). Mr Hernan Garcia referred to [Document IOC/IODE-XXIV/3.4.3.](#)

Mr Garcia recalled that the World Ocean Database (WOD) project continued to maintain and expand the world's largest unrestricted access uniform format, quality controlled, ocean profile database. More than 1 million oceanographic profile casts, both historic and recent, have been added to the WOD in the last two years, bringing the total number of oceanographic casts to slightly more than 15 million.

Regarding recently contributed data, the Argo profiling float programme continued to be the largest contributor. There were also substantial recent data from the Ship of Opportunity (SOOP) expendable bathythermograph (XBT) programme and Conductivity-Temperature-Depth (CTD) and bottle data from oceanographic research cruises.

Glider data are becoming the main source of coastal and continental shelf data found in the WOD. Significant interaction with oceanographic data centres around the world continues to augment the WOD holdings, and IOC Member States are encouraged to continue contributing ocean profile data to the WOD project.

For the next two years, WOD proposed to continue aggregating recent and historical ocean profile data, enhance quality control procedures, interact with oceanographic data centres, research projects, and other sources of data. The WOD project will continue to work to incorporate more of the numerous glider data into the WOD on a regular basis.

ACTION: The Committee is requested to:

- (i) comment on the work achieved and to approve the proposed work plan for the next inter-sessional period**
- (ii) invite IOC Member States to facilitate the flow of data to the WOD and to use Data Object Identifiers (DOIs) for oceanographic profile data, as well as Creative Commons (CC) data use licenses**
- (iii) agree that WOD submits an application to JCOMM to become a Centre for Marine Meteorological and Oceanographic Climate Data (CMOC) in the Marine Climate Data System (MCDS)**

3.4.4 Global Temperature and Salinity Profile Programme (GTSP)

This agenda item was introduced by Mr Charles Sun, Chair of the IODE Steering Group for the GTSP project. He referred to [Document IOC/IODE-XXIV/3.4.4.](#)

He recalled that the objectives of the project are: (i) To provide a timely and complete data and information base of ocean temperature and salinity profile data;

(ii) To implement data flow monitoring system for improving the capture and timeliness of real-time and delayed-mode data; (iii) To improve and implement agreed and uniform quality control and duplicates management systems; and (iv) To facilitate the development and provision of a wide variety of useful data analyses, data and information products, and data sets.

94 He reported that during the inter-sessional period the following activities were implemented: (i) Continued GTSP daily operations to process and preserve both real-time and non-real-time temperature and salinity data and maintained the project web sites at <http://www.nodc.noaa.gov/GTSP> / and <http://www.meds-sdmm.dfo-mpo.gc.ca/isdm-gdsi/gtspp/index-eng.htm> ; (ii) Populated the outcomes of the comparison between observed versus model-simulated temperature data for the North Pacific Region at <http://ds.data.jma.go.jp/gmd/gtspp/data/index.html> ; (iii) Conducted the second IODE OceanTeacher Academy Training Course on the Use of the Global Temperature and Salinity Profile Programme Data, 8-10 December 2015, Tianjin, China. (iv) Conducted the third (3rd) Session of the GTSP steering group, 17-18 November 2016, Oostende, Belgium. (v) Reported to the ninth (9th) Session of the IODE Committee, 27 – 31 March 2017, Kuala Lumpur, Malaysia, and (vi) Reported to the 24th Session of the joint WMO/IOC JCOMM Ship Observations Team (SOT), 27-31 March 2017, London, UK.

ACTION: The Committee is requested to comment on the work achieved and to consider the proposed work plan and budget for the next inter-sessional period.

95

3.4.5 Global Ocean Surface Underway Data Project (GOSUD)

96 This agenda item was introduced by Mr Loïc Petit de la Villéon, Chair of the IODE Steering Group for the GOSUD project. He recalled that the initial objectives of GOSUD are (i) to provide near real time sea surface salinity and sea surface temperature data for operational needs, and (ii) to provide delayed mode sea surface salinity for research purposes and for satellite data validation.

97 He mentioned that during the reporting period the GOSUD operations have been successfully conducted. In Situ, Sea Surface Salinity (SSS) and Sea Surface Temperature (SST) data have been collected, quality controlled and distributed in near-real time.

98 He also highlighted that 3 major delayed mode datasets were released after enhanced quality control process and calibration adjustments of the data using collected water samples.

99 He recalled that the Steering Group has been renewed and met in November 2016 in Oostende, Belgium. He mentioned that the GOSUD project plan was adopted during the IX^o steering group meeting and that the GOSUD new Steering Group membership reflects the willingness to expand the GOSUD data perimeter to more parameters than SSS and SST.

100 He recalled that, per the updated Project Plan, GOSUD will continue routine operations on SSS and SST but also will work to set up the following facilities:

- provide a distribution for Carbon data and related parameters
- provide a repository for FerryBox multi-parameters data
- provide a repository for shipborn (vessel-mounted) ADCP data from GOSHIP

101 He reminded the Committee that GOSUD is a best effort project and, for this reason, it is difficult to conduct. Finally he recalled that GOSUD is seeking one or two

chair persons to take over from the present ones not later than June 2018.

ACTION: The Committee is requested to comment on the work achieved and to consider the proposed work plan and budget for the next inter-sessional period.

102

3.4.6 International Coastal Atlas Network project (ICAN)

103 This agenda item was introduced by Ms Marcia Berman, Co-Chair of the IODE Steering Group for the ICAN project. She referred to [Document IOC/IODE-XXIV/3.4.6](#).

104 The Co-Chair of the ICAN introduced the overall objective of the project which is to encourage and facilitate the development of an integrated network of digital atlases of the global coast based on the principle of distributed, high-quality data and information. Coastal Web Atlases (CWAs) are being developed at local, regional, national and international scales all over the globe. Through the sharing of knowledge and experience, the ICAN has seen a great expansion of this activity of the last decade. ICAN provides solutions and support to atlas developers and the user community to maximize data integrity, product relevance, and added value for the coastal community of practice.

105 Ms. Berman reported that during the inter-sessional period the following activities were implemented: (i) continued expansion of the website transition (<http://ican.iode.org>); (ii) expert travel and outreach: two ICAN Newsletters were published; ICAN has built strong synergies with the Ocean Teachers Academy by providing technical expertise and training at OTA sponsored events such as SPINCAM, ODINAFRICA and the Caribbean LME projects. ICAN members participated in 6 other training programs around the globe. ICAN members presented 10 scientific and technical papers and talks at 10 international meetings around the globe; (iii) the ICAN-7 workshop on "Supporting Ecosystem Based Management was held in April, 2015 in Cape Town, South Africa. This event was held in conjunction with the OTA and the international CoastGIS conference. (iv) the network of global coastal web atlases has expanded to 71; (v) a published guide edited by two ICAN SG members on best practices for engaging your CWA user community was in final draft and ready for press at the time of this reporting [Kopke K. & Dwyer N. (Eds.). (in prep) ICAN - best practice guide to engage your CWA user community. Paris. Intergovernmental Oceanographic Commission of UNESCO (IOC Manuals and Guides 75) 28 pp. (English) (IOC/2016/MG/75)]; (vi) the technical team created access to cookbooks, archived information, and technical forum discussions globally through the use of the GitHub; (vii) the ICAN SG has begun planning discussions and coordination with INVEMAR to host the ICAN8 Workshop in 2017 in Santa Marta, Colombia; teaming once again with the Ocean Teacher Academy and the International CoastGIS Conference, with what promises to be another well attended event in direct support of the coastal web atlas community.

ACTION: The Committee is requested to:

(i) approve the ICAN work plan and budget

(ii) provide feedback on ICAN activities

(iii) support ICAN activities by encouraging relevant organizations and projects within the Committee's networks to join the ICAN if appropriate and take part in ICAN workshops

106

3.4.7 International Quality Controlled Database project (IQuOD)

107 This agenda item was introduced by Ms Catia Domingues, Co-Chair of the IODE Steering Group for IQuOD. She referred to [Document IOC/IODE-XXIV/3.4.7](#).

108 Through coordination of resources and expertise into a single best practice international community effort, the IQuOD project aims to produce, freely distribute and curate the highest quality, most complete and consistent global ocean subsurface temperature profile repository for Earth system, climate and ocean studies, with (intelligent) metadata and an uncertainty estimate for every observation.

109 Major activities during this inter-sessional period included: (i) development of a "first cut" intelligent metadata algorithm; (ii) development of "first cut" uncertainty estimates; (iii) implementation of exact duplicate checks; (iv) implementation of 49 community-based quality control procedures on github; (v) selection of high quality regional datasets for auto-quality control benchmarking.

ACTION: The Committee is requested to comment on the work achieved and to consider the proposed work plan and budget for the next inter-sessional period.

110

3.4.8 IODE OceanDataPortal

111 This agenda item was introduced by Mr Tobias Spears, Chair of the IODE Steering Group and Project Manager for the ODP project. He referred also to Dr Sergey Belov, ODP Technical Manager as co-author of the [Document IOC/IODE-XXIV/3.4.8](#).

112 The IODE Ocean Data Portal activity focused primarily on support for existing node and data providers during this inter-sessional period. Technology and content upgrades were incorporated into the ODP global node and Sistema Nacional de Datos del Mar (SNDM) regional node. The ODINWESTPAC regional ODP node is currently active with initial data contributions currently accessible, and mobilization of data in support of the ODINAFRICA regional node continues. The ODINBLACKSEA regional ODP node is in the process of being re-established.

113 The ODP team has continued to participate in the brokering activity within Ocean Data Interoperability Platform (ODIP), and collaborate with EMODNet Physics, SeaDataNet, and WMO in order facilitate the exchange of data with other systems and to contribute to the development and promotion of standards and best practices.

114 The ongoing challenges with increasing the network of ODP node and data providers resulted in a review of the state of the ODP and a follow-up discussion with the IODE Officers in January 2016. As a result of this review, the team has been working with EMODNet Physics as an initial demonstration for how the ODP activity can be realigned to better promote and leverage other established systems and programs, while supporting IODE stakeholders in improving discovery and access to their marine data.

115 The Committee was also reminded that the agreement between the Russian Federation's ROSHYDROMET and IOC regarding the "Partnership Centre for the IODE Ocean Data Portal" would expire (after 5 years) on 27 March 2018. In accordance with the MoU "*UNESCO/IOC and Roshydromet will review the contribution of the Partnership Centre for the IODE ODP to the objectives and activities of the IODE prior to the expiry of this Memorandum of Understanding. The results of the review will be submitted for consideration to the IODE Committee that oversees the activities of the Partnership Centre for the IODE ODP. The IODE Committee may, as it deems necessary, recommend the renewal or extension of this*

Memorandum of Understanding to the two participants". Taking into account that the MoU would expire during the next intersessional period (2017-2019) the Committee was requested to propose modalities for the review of the contribution of the Partnership Centre to the IODE ODP.

ACTION: The Committee is requested to:

(i) comment on the work achieved and to consider the proposed work plan and budget for the next inter-sessional period.

(ii) propose modalities for the review of the contribution of the Partnership Centre to the IODE ODP

116

3.4.9 IODE OceanDataPractices

117 This agenda item was introduced by Ms Pauline Simpson, Project Manager of the ODPr project. She referred to [Document IOC/IODE-XXIV/3.4.9](#).

118 Mrs. Pauline Simpson explained that Organizations and expert communities in marine data and information management have been generating and publishing best practices, but, there was always a lack of an exclusively best practices repository. OceanDataPractices (ODPr) is created to fill this niche and provide a platform for organizations to work on common standards and avoid duplication. ODPr will allow individual researchers from all around the world to find and follow practices approved by specialized expert bodies and organizations.

119 The successful implementation of the OceanDataPractices repository is a contribution to the wider remit of the ODSBP Project. A Policy Document was submitted by the ODPr project team to the parent project in 2015 for approval and implementation, but no action has been taken. The ODPr project team continue to make additions to the repository and intend in 2017 to synchronize the functionality already implemented in OceanDocs (same DSpace software). The limited time available from the IODE ICT support means that it is necessary to look for contractor help to achieve this. An online usability survey will be conducted after this ODPr work has been completed for feedback and also as an advocacy tool.

ACTION: The Committee is requested to:

(i) promote OceanDataPractice in their region.

(ii) encourage organizations and expert bodies in their communities to deposit best practice documents in OceanDataPractices

(iii) identify ICT experts in their region who could help with technical tasks related to the project.

120

3.4.10 IODE OceanDocs

121 This agenda item was introduced by Ms Pauline Simpson, Programme Manager of the OceanDocs project. She referred to Ms Jennifer Walton and Ms Arame Keita, incoming Co-Chairs of the SG-OceanDocs as co-author of [Document IOC/IODE-XXIV/3.4.10](#).

122 Ms Simpson recalled that OceanDocs was a digital repository of ocean research outputs particularly publications. In her presentation she provided a

positive picture of the growth of OceanDocs, underlining this with such statistics as a 33% increase in deposits during 2015-2016 (1800 deposits). Activities in the past two years reflect a supportive Steering Group and a dynamic management strategy alongside efficient responses to depositors' submissions and queries. An intensive advocacy campaign has resulted in a large OceanDocs Community listserv and new deposits worldwide, particularly welcoming is Vietnam and Philippines, Iran and Brazil. She made a call for the badly needed increase in the IT support for the OceanDocs DSpace repository software. With the help of the IODE Community in also using and depositing and supporting the expansion of OceanDocs we look forward to OceanDocs making a more significant contribution to open access to research outputs in the marine sciences.

123 She further introduced the work plan for the next inter-sessional period.

ACTION: The Committee is requested to:

(i) Request all Member States to encourage the deposit of works in OceanDocs or implementation of their own national/institutional e-repository with OceanDocs assistance.

(ii) Request all Member States to join the OceanDocs Community to advocate deposit and use of OceanDocs

(iii) Discuss the overall IT product support at IODE PO with a view to providing additional capacity.

124

3.4.11 IODE OceanExpert

125 This agenda item was introduced by Ms Linda Pikula, Chair of the IODE Steering Group for the OceanExpert project. She referred to Mr Aditya Naik-Kakodkar as co-author of [Document IOC/IODE-XXIV/3.4.11](#).

126 Ms Pikula recalled that OceanExpert began its life as GLObal DIRectory of Marine and Freshwater Professionals (GLODIR) in 2007. It was established as a formal IODE project through IODE XXIII, 2015, Recommendation 2. OceanExperts provides a online service to create and maintain profiles of oceanographers and oceanographic institutions. It is also used by the IOC community to maintain information and statistics on official events taking place at IOC and its programmes. At present (November, 2016) it contains information on 11,633 experts, 4130 institutions, 1,656 events and 17,111 documents.

127 To keep up with advancements of technology and to enable the development of new functionality, OceanExpert was completely redesigned and redeveloped in 2016. The previous version of the OceanExpert "engine" and interface dated from 2007. A lot of focus has been placed on enhancing the user experience. The new interface has a responsive design and supports mobile devices. Several workflows have been redesigned to increase efficiency. Online security of the system and the users has been enhanced by using the latest password encryption and highly secured web development framework.

ACTION: The Committee is requested to:

(i) promote OceanExpert nationally and regionally.

(ii) encourage oceanographers to create and maintain their profiles in OceanExpert.

128

3.4.12 IODE OceanKnowledge Platform Pilot Project

129 This agenda item was introduced by Ms Pauline Simpson, Chair of the IODE Steering Group for the OceanKnowledge Platform project. She referred to Mr Aditya Naik-Kakodkar, Project Manager as co-author of [Document IOC/IODE-XXIV/3.4.12](#).

130 Ms Simpson recalled that over the years, the International Oceanographic Data and Information Exchange (IODE) has created a number of data and information products to serve the demand from the oceanographic community and wider for relevant, accurate and up-to-date ocean data and information. These products range from information on individuals and documents to physico-chemical and biological data. OceanKnowledge is planned to map linkages between these diverse sets of data and information. The resulting scalable system will provide a simplified and structured single point discovery interface not only to IODE products but eventually to products from partner organizations and more.

131 Whilst the OceanKnowledge description sounds simplistic, the underlying semantic technology, standards, interoperability, linked data and information exchange between content providers and their microdata layers requires innovative high tech solutions to pull together the information model.

132 A Project Plan has been produced that defines use cases and provides a start point system diagram. A rewrite of the primary content provider OceanExpert has taken all of 2016, but once this building block is back in place, work on developing the OceanKnowledge Platform can proceed. Interest has been shown in the project from IOC and LME:Learn (Large Marine Ecosystems Learn) Programmes. It is obvious the project needs resource investment (additional ICT developers) to take this forward to at least a prototype stage during 2017 to what eventually will be a major technological contribution to the Global Information Portal. The work on the OceanKnowledge Project is expected to contribute to the IOC Audit recommendation for a 'universal information system and ocean data portal'

ACTION: The Committee is requested to identify Information and Computer Technology (ICT) experts from their respective countries to contribute to the project. Volunteers with proven skills in semantic web or big data technologies could submit their letter of interest to the Project Manager which clearly states their competencies and hands-on experience in the field. The steering group will invite experts to join the project based on its operational requirements.

133

3.4.13 IODE OpenScienceDirectory

134 This agenda item was introduced by Ms Linda Pikula, Chair GE-MIM. Ms Pikula informed the Committee that the OpenScienceDirectory activity is not a "standard" project but is rather a service offered by a Member State and commercial company to the ocean research community since 2008. The Open Science Directory (<http://www.opensciencedirectory.net>), which utilizes EBSCO's A-to-Z[®] locator product to provide access to useful scientific information needed in many of the world's developing nations, has originally been developed by EBSCO and Hasselt University Library based upon a request by marine information management experts collaborating within the framework of the IOC's IODE programme.

ACTION: No action required

135

3.4.14 IODE Quality Management Framework project (QMF)

136 This agenda will be introduced by Mr Greg Reed (Chair SG-QMF), referring to [Document IOC/IODE-XXIV/3.4.14](#).

137 He recalled the objectives of the project as: (i) provide the overall strategy, advice and guidance to NODCs to establish organizational quality management systems for the delivery of oceanographic and related data, products and services; (ii) initiate and review existing standards and Manuals and Guides with respect to the inclusion of quality management procedures and practices; (iii) apply the necessary capacity development activities to ensure accreditation of NODCs according to agreed criteria in order to bring all NODCs to a minimum agreed level.

138 Mr Reed informed the Committee that during the inter-sessional period the focus for IODE-QMF was on educating the community and encouraging NODCs to apply for accreditation. A successful training course was held from 30 November to 3 December 2015 on Quality Management System Essentials for National Oceanographic Data Centres, which was attended by 10 representatives of NODCs and ADUs. The training course provided an introduction to the development, implementation and management of a Quality Management System and the IODE accreditation requirements for NODCs. The aims and objectives of the course were: (i) To introduce the IODE Quality Management Framework; (ii) To explain the importance of quality for oceanographic data; (iii) To introduce the ISO 9000 series of standards; (iv) To provide a description of a Quality Management System; (v) To enable a clear understanding of the requirements of a quality manual; and (vi) To describe accreditation of National Oceanographic Data Centres. Most course participants indicated that their institution will implement a QMS and apply for IODE accreditation.

139 The accreditation process is currently open to all NODCs. As the number of ADUs is growing (currently 22) and ADUs are contributing data to NODCs and the OBIS portal as data providers, it is important that those ADUs that meet the IODE accreditation requirements are recognized. It is recommended that ADUs can apply for accreditation and those ADUs that meet the IODE accreditation requirements will be awarded the status of **Accredited IODE Associate Data Unit**.

140 Mr Reed noted that there had been slow uptake of the Quality Management Framework from the IODE community and all NODCs are encouraged to develop a Quality Management System for the Centres and to apply for IODE accreditation.

141 Mr Reed informed the Committee that during the inter-sessional period one application had been received and positively evaluated: the French National Oceanographic Data Centre (SISMER). Accordingly SISMER is now an accredited IODE NODC. A certificate was issued to SISMER.

ACTION: The Committee is requested to :

- (i) review the progress of the IODE-QMF project,
- (ii) nominate experts with experience in implementing quality management systems for management of oceanographic data to the SG-QMF for the next intersessional period,
- (iii) revise the terms of reference of the IODE QMF project ([Recommendation IODE-XXII.18](#)) to allow ADUs to be accredited ([Recommendation](#))
- (iv) encourage all NODCs and ADUs to apply for accreditation.

142

3.5 PROGRESS REPORTS OF JOINT ACTIVITIES WITH OTHER PARTNERS

- 143 This agenda item was introduced by Prof Yutaka Michida. He informed the Committee that IODE, in addition to implementing its own projects and other activities also collaborates closely with other bodies such as the Joint WMO-IOC Technical Commission for Oceanography and Marine Meteorology (JCOMM) as well as with an increasing number of IOC programmes, thereby responding to the new IOC structure that focuses on 6 functions documented in the IOC Medium-Term Strategy (2014-2021).

3.5.1 JCOMM

- 144 This agenda item was introduced by Mr Sergey Belov, Chair of the JCOMM/IODE ETDMP. He informed the Committee on the most recent developments in JCOMM related to oceanographic data management and the role of, or opportunities for IODE.
- 145 He recalled that the primary objective of DMCG is to build an integrated global marine meteorological and oceanographic data infrastructure driven by common data management practices and procedures to support the JCOMM Strategy in close collaboration between the IOC International Oceanographic Data and Information Exchange (IODE) and WMO Information System (WIS).
- 146 The Marine Climate Data System (MCDS) which was established at JCOMM-4 to address the WMO-IOC requirements for climate monitoring, forecasting and services has made significant progress. Candidates for Centres for Marine-meteorological and Oceanographic Climatological Data (CMOCs), Global Data Assembly Centres (GDACs) and Data Acquisition Centres (DACs) centres have been identified under the MCDS structure. Informal and formal discussions has taken place with number of candidate centres. One CMOC centre in China hosted by National Marine Data and Information Service, State Oceanic Administration(NMDIS/SAC) has been established by WMO and IOC. Other possible CMOC centres include for example the International Comprehensive Ocean-Atmosphere Data Set (ICOADS), World Ocean Database (WOD), and are under consideration.
- 147 Mr Belov noted that the Terms of Reference(ToR) defined for GDACs under the MCDS structure and the IODE structures are very similar except for one clause which is related to the connection of these centres to the WMO Information System (WIS) and the IODE Ocean Data Portal (ODP) (See Figure 1). At the 13th JCOMM Management meeting, it was agreed and advised to harmonize the ToR of the GDACs between the MCDS and the IODE by including the clause “connection to WIS/ODP” as an optional item which will provide flexibility for the GDACs to be part of MCDS and IODE without constraints. It therefore is proposed to have joint IODE-JCOMM GDACs with unique ToRs. Reference is made to agenda item 3.3 in this regard.
- 148 Trial GDACs for drifting buoys (France/Canada) were established by JCOMM-4 (2012). [At the time of writing this report] Canada has unofficially confirmed the commitment to become a GDAC for drifting buoys. Progress has also been made in developing regulatory and guidance material under the WMO for the MCDS.
- 149 Mr Belov noted that JCOMM DMCG and IODE are working towards a collaborative effort on data management, to also include perspective of the JCOMM Observations Programme Area with regard to data management integration, including for the real-time flow, using technologies such as OPeNDAP and ERDDAP. Thus key principles of the JCOMM Data Management Strategy will align with the IOC Strategic Plan for Oceanographic Data and Information Exchange which is under review, and key elements of the JCOMM DM Strategy are proposed to be reflected in

the IOC strategic plan. JCOMM DM Strategy will be presented to the JCOMM V for approval.

- 150 The JCOMM Management Committee at its 13th Session (Geneva, Jan. 2017), while noting that the IODE was dismantling its Groups of Experts and forming projects to replace them, agreed that JCOMM-5 should be invited to re-instate the ETDMP under JCOMM Working Structure, and to add in its Terms of Reference requirements to address Table Driven Codes. IODE will be invited to endorse the new ETDMP, once and if established by JCOMM-5 as a joint Team with the IODE.

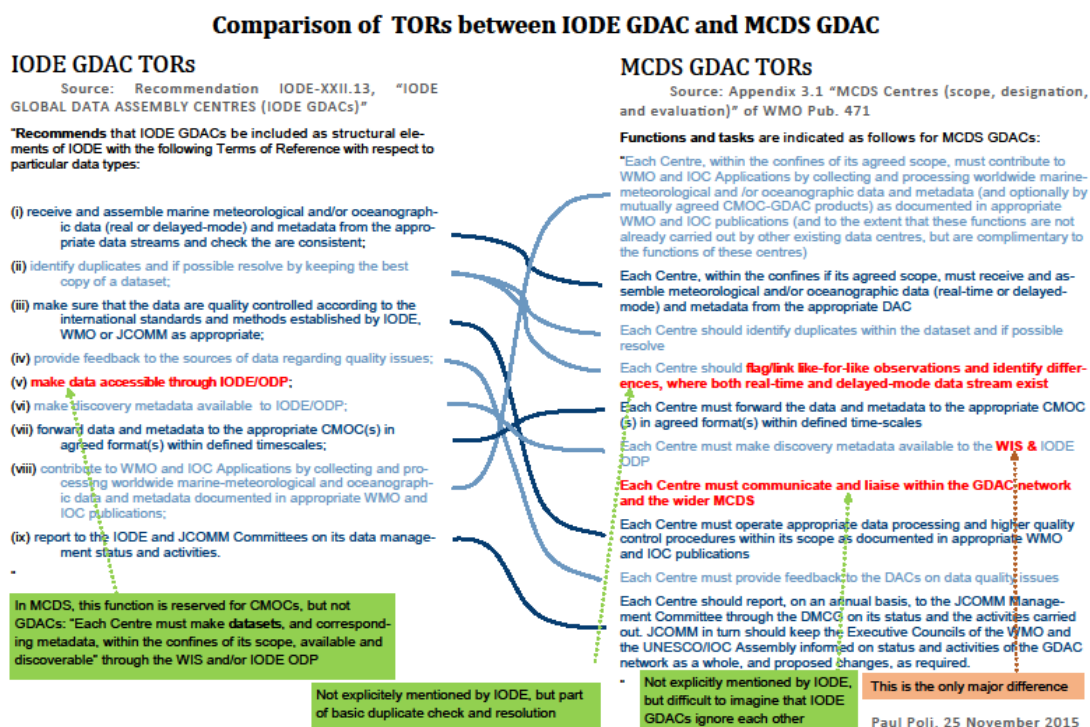


Figure 1: Comparison between IODE GDAC and MCDS GDAC

ACTION: The Committee is requested to consider the continuation of the Joint JCOMM/IODE ETDMP under agenda item 3.2.1

151

3.5.1.1 Ocean Data Standards and Best Practices (JCOMM/IODE)

- 152 This agenda item was introduced by Prof Yutaka Michida, Co-Chair of SG-ODSBP, referring to [Document IOC/IODE-XXIV/3.5.1.1](#).

- 153 He reported on the activities of the ODSBP project during the last inter-sessional period. At the IODE Officers' meeting in June 2016, big delays of the reviewing processes for the proposals submitted over the last 1.5 years were recognized and acceleration of the processes was strongly recommended.

- 154 The internal review for all of 6 proposals, CDI and its XML encoding as

metadata model, CSR and its XML encoding as cruise reporting, NetCDF as data transport model, submitted by SeaDataNet, and vocabularies jointly submitted by SeaDataNet and ODIP project, was completed by the end of October 2016.

155 Four of 6 proposals are now in the stage of 'Expert Review', while the remaining two for NetCDF and vocabularies will follow shortly.

156 He noted that it took more time than expected to seek appropriate experts for the expert reviewing.

ACTION: The Committee is requested to comment on the work achieved and recommend further action

157

3.5.2 IOC

3.5.2.1 GOOS

158 This agenda item was introduced by Patrick Gorringe (EuroGOOS). He recalled that data management (assembly, synthesis, distribution, archiving) is a core output considered in the Framework for Ocean Observing (doi:10.5270/OceanObs09-FOO, 2012), which is a guiding document for the work of the Global Ocean Observing System (GOOS). Therefore IODE has an important role to play in the full functioning of GOOS, and this is recognized with its ex officio seat on the GOOS Steering Committee.

159 The data management activities and interests of GOOS are most closely associated with the observations coordination activity, which has two major pillars: the JCOMM Observations Coordination Group (OCG), and the GOOS Regional Alliances.

160 JCOMM OCG unites the global observing networks: the Data Buoy Cooperation Panel (surface drifters and moorings), the Ship Observations Team (observations from commercial vessels), the GLOSS tide gauge network, Argo (profiling floats), GO-SHIP (repeat basin-scale hydrography from research vessels), and IOCCP (other ocean carbon measurements). It has also started collaboration with a global subsurface glider network OceanGliders and HF coastal radar sites. The main interest of the OCG in data management is to promote network-based best practices and standards in data management, including best practices in quality control, real-time data streams, archiving, synthesis, and a focus on interoperability of access to data streams through the ERDDAP protocol (see also item 3.5.1 JCOMM). The proposed biogeochemistry GDAC in Bergen, Norway, grew out of data synthesis activities of the IOCCP and the oceanographic community. The OCG also oversees the work plan of the JCOMM In Situ Observing Programme Support Centre (JCOMMOPS, Brest, France), which amongst other functions, serves as a metadata and data flow tracking centre, in support of the operators of the observing networks. Some of these network-based data centers are outside of traditional NODCs, emphasizing the importance of IODE engagement with ADUs. The link between IODE and the JCOMM Data Management Programme Area must be transparent and strong for GOOS's Framework for Ocean Observing to function.

161 Many of the GOOS Regional Alliances also operate their own data centers at the regional, national, or sub-regional level. Thus far, the collective effort of the GRAs in data management has been focused on the metadata, and being able to show all of the in-water assets of the GRAs on a common map. This effort has been led by EuroGOOS on the basis of the EMODNET Physics portal. Strong data management efforts in the US IOOS, in Europe with EuroGOOS and others, and in the Australian IMOS are already collaborating, and could form the basis of further GRA projects in

mutual aid around data management.

162 As biological and ecological observations under GOOS develop, a strong cooperation has already been developed with OBIS. But new observing networks incorporated into GOOS will bring their own data management systems and challenges. And overall, network-focused data management systems should be better incorporated into an approach around the delivery of data on Essential Ocean Variables (EOVs), where IODE could play a reinforced role.

163 GOOS is developing a 5-10 year strategy that recognizes the importance of strong interfaces with the data management community in order to deliver on the full promise of GOOS, and get observations from observing networks to their primary and eventually their final users, in the area of climate, operational ocean services, and ocean health. A draft strategy will be circulated in mid-2017 for input from the ocean observing community, including IODE.

164 The International Council for Science (ICSU), one of GOOS's sponsors, is proposing a review of GOOS in late 2017 - early 2018. The scope of this review will be decided by all of the sponsors of GOOS (IOC/UNESCO, WMO, UNEP, and ICSU), and arguably should include the intersection of observing with data management systems, and so therefore with IODE and other activities. GOOS therefore anticipates asking for IODE's cooperation in this review.

165 Other more specific areas of cooperation identified could include observing-focused capacity development done in cooperation with OTGA, or auditing of EOVS data streams, amongst other activities.

ACTION: The Committee is requested to :

- (v) provide input into the GOOS 5-10 year Strategy in mid-2017,
- (vi) participate in the review of GOOS to be conducted by ICSU and the other co-sponsors of GOOS (IOC, WMO, and UNEP) in late 2017,
- (vii) consider the role IODE plays as interface between data provider (JCOMM OCG networks and GRAs) and user communities (for ocean data and information products related to climate, operational services, and ocean health) in its the IOC Strategic Plan for Data and Information Management .

166

3.5.2.1.1 GEO BON/MBON

167 This agenda was introduced by Mr Ward Appeltans. He reported on the objectives of GEO BON MBON and the recent collaboration agreement between GEO BON MBON, GOOS BioEco and OBIS.

168 The Marine Biodiversity Observation Network of the Group on Earth Observations Biodiversity Observation Network (GEO BON MBON) is a thematic BON that evolved from GEO BON's Working Group on "Marine Ecosystem Change" and is envisioned as the key biodiversity pillar of GEO and GEO BON for the marine realm. The MBON aims to help coordinate individual monitoring programs and existing networks focused on local, regional and thematic aspects of marine biology and biodiversity and facilitate the sharing of data, experiences, and protocols to understand species and the status and trends of ecosystems and their services.

169 On 15 December 2016, GEOBON MBON signed a collaboration agreement with GOOS BioEco and OBIS to join efforts towards a sustained, coordinated global ocean system of marine biological and ecosystem observations to support management decisions and address relevant science and societal needs. Both GEO

BON MBON and GOOS BioEco agreed that OBIS will play a key and central role in fostering wider data sharing, data curation and aggregation in order to streamline the feeding of integrated and quality controlled datasets into models and forecasts.

ACTION: The Committee is requested to comment on the work achieved

170

3.5.2.2 MPR (Marine Policy and Regions)

171 This agenda item was introduced by Mr Julian Barbière. He noted the various areas related to marine policy and regions where IODE and MPR worked together both at the global and regional level. In this regard he referred to BBNJ (OBIS), ICAM and MSP (through ICAN and CMA2), and LME:Learn (OTGA). He then provided more detailed information on a few of these activities.

3.5.2.2.1 SPINCAM

172 This agenda item was introduced by Mr Julian Barbière. He referred to [Document IOC/IODE-XXIV/3.5.2.2.1](#) (SPINCAM-3).

173 Mr Barbière explained that SPINCAM (Southeast Pacific data and information network in support to integrated coastal area management) has supported the current national decision-making processes, by identifying ecological and socio-economic baselines and trends on the use of coastal areas and coastal resources, hence informing the definition of future strategies to face regional and global changes.

174 Within a global perspective, SPINCAM has provided all the partners involved with an excellent opportunity to contribute to the establishment of a reporting mechanism on the state of marine environment in the region and as a support to the countries to report on the Agenda 2030 sustainable development goals.

175 Furthermore, synergies and cooperation have been established with other projects of UNESCO, also funded by the Government of Flanders in the Latin American and Caribbean region, such as the Caribbean Marine Atlas II led by the IOC Project Office for IODE and IOCARIBE and BRESEP – Biosphere Reserves as a Tool for Coastal and Island Management in the Southeast Pacific Region led by the UNESCO Programme Man and Biosphere.

176 With respect to global projects and initiatives, SPINCAM II has increased the linkages with the GEF funded projects in the context of large marine ecosystems for both the Caribbean and in the Humboldt current, in addition to the linkages with the GEF Project on Transboundary Water Assessment Programme (TWAP) and the new initiative LME:Learn led by IOC/UNESCO.

177 SPINCAM partners have been active members of the International Coastal Atlas Network (IODÉ Project) and IBERMAR – Ibero-American Network of Integrated Coastal Area Management.

ACTION: The Committee is requested to support the implementation of SPINCAM 3 through the active participation of IODE and related Projects (particularly CMA2, OTGA, OBIS and ICAN) in SPINCAM 3 activities, including the Inception meeting scheduled in May 2017.[note: currently not included in budget]

178

3.5.2.2.2 LME-Learn

179 This agenda item was introduced by Mr Julian Barbière, referring to [Document IOC/IODE-XXIV/3.5.2.2.2](#) (LME:Learn).

180 Mr Barbière recalled that the purpose of LME:LEARN is to improve global ecosystem-based governance of Large Marine Ecosystems and their coasts by generating knowledge, building capacity, harnessing public and private partners, and supporting south-to-south learning and north-to-north learning.

181 The project aims to meet this through identifying the priority issues affecting governance of the LMEs, along with their associated coastal zones, and marine protected areas, as well as their underlying root causes, and by integrating these in a global ecosystem-based governance framework founded on global coordination and cooperation.

182 IODE contributes to the implementation of the LME:learn project by leading data and information related activities organized under the Project's Working Group on Data and Information Management. The Working Group is chaired by the head of IODE Project Office, who also sits on the project Steering Committee.

ACTION: The Committee is requested to consider the inclusion in the Work Plan and budget the requested financial support for (i) travel support for IODE representative to Steering Committee meetings in 2018; (ii) hosting of LME:Learn D&IM WG in 2017 (no cost)

183

3.5.2.2.3 Sustainable Development Goals (SDG)

184 This agenda item was introduced by Mr Julian Barbière. He explained that in 2015, the United Nations adopted the Agenda 2030 and a set of Sustainable Development Goals (SDG), including a dedicated goal on the ocean, SDG #14 which calls to "conserve and sustainably use the oceans, seas and marine resources for sustainable development". This constitutes an essential point of reference for IOC's engagement with its Member States as well as for its programmes at the global, regional and country levels.

185 The IOC Executive Council at its 49th session decided that IOC should 'Provide normative support to countries to establish, implement, monitor and report on implementation of the Ocean SDG 14 and its related targets'. Through the establishment of an Inter-agency and Expert Group on SDG Indicators (IAEG-SDGs), composed of Member States and including regional and international agencies as observers, a formal SDG reporting process has now been established under the UN and a set of global indicators have been agreed to facilitate the follow-up and review of the 2030 Agenda and SDGs.

186 As part of this process, IOC has been identified as custodian agency for two SDG 14 targets and related indicators, these relate to ocean acidification (Target 14.3) and marine scientific research (Target 14.a). Under this custodianship role, IOC will need to further develop the indicator methodology and underlying data standards for these 2 targets, before the indicators are operational and routinely measured by Member States. Once this is done, the indicators will be cleared by the IAEG-SDGs and implemented through a periodic UN SDG reporting.

187 Once these SDG indicators are operational, IOC will have the responsibility at the global level to provide internationally comparable data in the different statistical domains, calculate global and regional aggregates, and provide data and accompanying metadata to UN Statistical Department.

188 At the national level, national statistical systems or a designated national coordination body will have the task to collect data according to agreed standards and provide these data and metadata for global reporting to the IOC.

ACTION: The Committee was requested to:

(i) Ensure representation and inputs of IODE in the work of technical expert groups that will be established to finalize the indicator methodology and definition of data standards for IOC-led indicators;

(ii) Highlight at the national level the contribution of National Oceanographic Data Centres and Associate Data Units as a possible mechanism for reporting on IOC led SDG indicators, either through National Statistical Offices or directly;

(iii) Identify ways and means to support the IOC role in SDG data reporting at the global level, including through the designation of an IODE officer that can act as focal point for SDG data issues;

(iv) Support the development of capacity development activities in relation to data quality control, data access and dissemination.

189

3.5.2.3 Ocean Science

190 This agenda item was briefly introduced by Ms Cyndy Chandler, Co-Chair.

3.5.2.3.1 GOSR

191 This agenda item was introduced by Ms Cyndy Chandler, Co-Chair.

192 The Global Ocean Science Report (GOSR), to be published in June 2017, is a first time ever effort undertaken by IOC and its Member States to identify and quantify the key elements of ocean science, including workforce, research expenditure, infrastructure and publications globally. GOSR will provide decision-makers with a tool to identify gaps and opportunities to advance international collaboration in ocean science and technology to meet societal needs and to promote the contribution of ocean research to address global challenges related to sustainable development.

193 Target 14.a calls for “increase scientific knowledge, develop research capacity and transfer marine technology, taking into account the IOC Criteria and Guidelines on the Transfer of Marine Technology, in order to improve ocean health and to enhance the contribution of marine biodiversity to the development of developing countries, in particular small island developing States and least developed countries. Until present, no global mechanism for assessing and reporting on the level of human capacity, technology, investments, and needs of nations in ocean and coastal science, observations and services was available. GOSR will provide such reporting mechanism to inform progress towards the attainment of Target 14.a.

194 IODE has contributed to the production of the first issue of GOSR by coordinating input for the chapter on data and information management, based on a specialized survey focusing on data management and information exchange. This section of the report looks in particular into status and trends in national responses to requirements for handling oceanographic data and information, including infrastructures for data management, and access to and availability of data and information to policymakers and the general public.

195 Because the intended periodicity of GOSR is five years, a GOSR data portal will be needed as a mechanism to collect and deliver relevant information on a regular basis. The portal will be based on a document repository and provide access to raw data, meta data, and literature. It will also contain a function to alert the IOC Secretariat about mistaken or missing data and information by provision of quality

control by Member States.

ACTION: The Committee was invited to consider the following contributions to GOSR:

(i) Identifying main elements and advise on a possible architecture of the GOSR data portal;

(ii) Advise on practical modalities and standards to collect and update the data in the first issue of GOSR with reference to research capacity and infrastructure, research investments (research and observations), and research productivity and science impact, as well as relevant information on international organizations involved in ocean science, against the baseline provided by the first issue of GOSR;

(iii) Advise on modalities of collaboration between IODE and the UNESCO Institute of Statistics (UIS);

(iv) Assist in determining the scope of human and financial resources which may be needed to design and operationalize the GOSR data portal;

(v) Provide any other relevant feedback on lessons learned in the context of IODE's contribution to the first issue of GOSR.

[note: The Committee may consider establishing a task team to address the above requests – volunteers requested]

196

3.5.2.3.2 HAEDAT

197 This agenda item was introduced by Mr Ward Appeltans.

198 The Harmful Algae Event Database (HAEDAT) is a database containing records of harmful algal events. The database is hosted at the IODE project office (<http://haedat.iode.org/>) and technically maintained by the OBIS secretariat. The information is maintained by national designated focal points via an online input interface. HAEDAT currently holds information on 4,934 HAB events from 42 countries, between 1980 and 2017. Not less than 1,148 (23%) HAB events are entered or updated since 2015. Currently, HAEDAT focuses on improved coverage in Sub-Saharan Africa, South East Asia and South America.

199 The system will be redesigned by the OBIS secretariat so that the HAB event information is stored in the OBIS-ENV-DATA data standard and becomes compatible with OBIS. This will make it easier to integrate HAB species distribution from OBIS with actual harmful events from HAEDAT into a single HABMAP portal, with the aim to serve statistics and products for the Global HAB Status Report, which is planned to be released by the end of 2017.

ACTION: The Committee is requested to comment on the work achieved

200

3.5.2.3.3 IOC Working Groups on IGMETS, TrendsPO, GO2NE

201 This agenda item was introduced by Mr Ward Appeltans.

202 The new IOC Ocean Sciences programme (adopted at the 49th session of the IOC Executive Council, June 2016) decided to continue the IOC international working group IGMETS (International working Group for Marine Ecological Marine Time

Series) and established two new IOC Group of Experts: TrendsPO (Investigate Climate Change and Global Trends of Phytoplankton in the Ocean) and GO2NE (Global Ocean Oxygen NEtwork).

- 203 Their Terms of References include the development of a data management plan and data access plan in accordance with respectively, the "Guidelines for a Data Management Plan" (IOC Manuals and Guides No. 73) and the principles of clause 1 (for IOC programmes) of the IOC Data Exchange Policy. The IOC working groups are also requested to align with existing networks such as OBIS, to identify data sets available and suited for inclusion in OBIS and if appropriate be archived in IODE NODCs and/or the World Ocean Database (WODB).

ACTION: The Committee is requested to comment on the work achieved and recommend further action

204

3.5.3 European Union Projects

3.5.3.1 EMODNET

- 205 This agenda item was introduced by Mr Patrick Gorringe. He explained that the European Marine Observation and Data Network (EMODnet) is a long term marine data initiative from the European Commission Directorate-General for Maritime Affairs and Fisheries (DG MARE) underpinning its Marine Knowledge 2020 strategy.

- 206 The main purpose of EMODnet is to unlock fragmented and hidden marine data resources and to make these available to public and private users. EMODnet consists of more than 160 organisations assembling marine data, products and metadata to make these fragmented resources more available to users relying on quality-assured, standardised and harmonised marine data which are interoperable and free of restrictions on use. The EMODnet data infrastructure is developed through a stepwise approach in three major phases.

- 207 Currently EMODnet has finished the 2nd phase of development with eight sub-portals in operation that provide access to marine data from the following themes: bathymetry, geology, physics, chemistry, biology, seabed habitats, human activities and coastal mapping. EMODnet development is a dynamic process so new data, products and functionality are added regularly while portals are continuously improved to make the service more fit for purpose and user friendly with the help of users and stakeholders.

- 208 Phase I (2009-2013) - developed a prototype (so called ur-EMODnet) with coverage of a limited selection of sea-basins, parameters and data products at low resolution;

- 209 Phase II (2013-2016) - move from a prototype to an operational service with full coverage of all European sea-basins, a wider selection of parameters and medium resolution data products;

- 210 Phase III (2016-2020) - works towards providing a seamless multi-resolution digital map of the entire seabed of European waters providing highest resolution possible in areas that have been surveyed, including topography, geology, habitats and ecosystems; accompanied by timely information on physical, chemical and biological state of the overlying water column as well as oceanographic forecasts.

ACTION: The Committee is requested to comment on the work achieved and recommend further action.

211

3.5.3.2 EOOS

212 This agenda item was introduced by Mr Patrick Gorringer. The European Ocean Observing System, EOOS, is a coordinating framework designed to align and integrate Europe's ocean observing capacity, promote a systematic and collaborative approach to collecting information on the state and variability of our seas, and underpin sustainable management of the marine environment and its resources.

213 EOOS aims to provide a framework within which European marine observations can be sustained and made available on a continuous basis for applications ranging from real-time services, through ocean health to climate services. EOOS will not take ownership or control of ocean observing in Europe. Rather, EOOS will provide a light and flexible coordinating framework to help manage and improve the existing observing effort, making it more efficient and effective at different geographical scales and for different users.

214 Specifically, EOOS will:

- (i) Align and connect existing initiatives to ensure efficiency and value for money;
- (ii) Identify gaps in the European observing capacity and foster initiatives to fill those gaps;
- (iii) Promote observing capacities which can benefit multiple sectors including research, policy, management and industry; and
- (iv) Ensure that European ocean observing is integrated into the global observation system(s) by providing a focal point for interaction with international programmes and partner initiatives outside of Europe.

215 An open stakeholder consultation ran for six weeks during December 2016 and January 2017, collecting views on an overarching ocean observing framework for Europe from a wide community of ocean data providers, infrastructure managers, technology developers, data users, and broader ocean observing stakeholders.

216 The results of the consultation will be released in Spring 2017 and the early results were presented at IODE-XXIV.

217 EuroGOOS and the European Marine Board are working together to promote and facilitate the establishment EOOS as an overarching ocean observing framework for Europe. In doing so, these networks are taking the initial steps to catalyze the development of EOOS on behalf of a wide community of ocean data providers, infrastructure managers, technology developers, data users and ocean observing stakeholders.

ACTION: The Committee is requested to comment on the work achieved and recommend further action

218

3.5.3.3 SEADATACLOUD

219 This agenda item was introduced by Ms Michèle Fichaut.

220 Ms Fichaut informed the committee that a new European project on SeaDataNet infrastructure has been launched under the H2020 Research and Innovation Action (RIA) funding Schema. The so called SeaDataCloud project started in November 2016 for a duration of 4 years and a total budget of 10 Million euros.

221 The new SeaDataCloud project aims at building upon and expanding the achievements of the SeaDataNet infrastructure, has the following main aims and objectives:

222 (i) **To enhance and innovate the SeaDataNet standards, products and**

services offered to an expanded multi-disciplinary community by adopting a European cloud environment (EUDAT), in order to improve the performance of the data discovery and access. The range of services will be expanded by specifying, developing and deploying advanced e-services to facilitate individual and collaborative research (for example, customised services MySeaDataCloud and Virtual Research Environment will be provided). The implementation of SeaDataNet standards will be facilitated by offering to data centres a preconfigured and pre-built system including all necessary data management tools, easily deployable and ready to use with minimal setup.

223 (ii) **To promote the adoption of the protocols and standards** developed for interoperability to other key downstream initiatives in the field to expand the communities of data providers and users, mainly by having a scientific committee composed of lead customers, such as science community, EMODnet, Copernicus Marine Environmental Monitoring Service (CMEMS), and international scientific programmes such as SOCAT, ARGO, and others.

224 (iii) **To present a long-term sustainable arrangement for the integrated SeaDataNet infrastructure** and network of the key data centres in Europe for in situ and remote sensing data for marine research (including coastal research) and their resources.

225 Ms Fichaut underlined that IOC-IODE is part of the SeaDataCloud consortium and will be involved in the training effort of the project for the organisation of the training workshop at IODE headquarters in Ostend (the training material will be made available on OceanTeacher system), and also in the organisation of the two IMDIS international conferences planned in the project (all the presentations will become available as web videos on IOC-IODE's OceanTeacher e-publishing and e-learning platform).

ACTION: The Committee is requested to comment on the work achieved and recommend further action

226

3.5.3.4 ECOPOTENTIAL

227 This agenda item was introduced by Mr Ward Appeltans.

228 Mr Appeltans recalled that ECOPOTENTIAL is a European Commission Horizon 2020 project on Making Earth Observation and Monitoring Data usable for ecosystem modelling and services (<http://www.ecopotential-project.eu/>). This project is Europe's contribution to GEO Ecosystems, one of the nine societal benefit areas of the Group on Earth Observations (GEO). It will use Earth Observation and in-situ monitoring data and new modelling approaches to assess ecosystem services in current and future conditions, and use this information for planning and management of protected areas (of which several UNESCO world heritage sites).

229 The OBIS secretariat, together with the University of Western Brittany (France) and other partners, are building a pilot study based on the distribution of cetacean populations (in particular fin whales and striped dolphins) and associated benefits to humans in the Pelagos Sanctuary (an international marine protected area in the Mediterranean). The project will support management and research organisations active in the Sanctuary to better understand the human-nature dynamics and understand which are the areas where greatest intervention or change in management practices is required.

230 OBIS plays an important role in data and information management and acts as a data sharing facility. The OBIS database is now brokered with the GEO portal thanks to the development of a powerful RESTful JSON API on OBIS. The next steps will focus on the development of a data analysis workflow/model and publish

the output via the GEOSS virtual laboratory platform.

ACTION: The Committee is requested to comment on the work achieved

231

3.5.4 ICSU World Data System (WDS)

232 This agenda item was introduced by Dr Lesley Rickards on behalf of Dr Mustapha Mokrane, Executive Director, International Council for Science World Data System (ICSU-WDS).

233 The mission of the ICSU-WDS is to promote long-term stewardship of, and universal and equitable access to, quality-assured scientific data and data services, products, and information across a range of disciplines in the natural and social sciences, and the humanities. WDS was established by ICSU in 2009, building on the recognized legacy of its World Data Centres and Federation of Astronomical and Geophysical data analysis Services. Dr Rickards reminded the Committee that IODE had a long and fruitful relationship with the WDCs for Oceanography, and this relationship is continuing and being strengthened under WDS – in particular as IODE is a Network Member.

234 The WDS International Programme Office (WDS-IPO) coordinates the daily operations of ICSU-WDS and implements the decisions of the WDS Scientific Committee (WDS-SC). The IPO organizes meetings of the SC and the biennial WDS Conference, as well as conducting outreach and promotional activities. Following a new agreement with International Council for Science (ICSU), the WDS-IPO will be hosted and financially supported until 31 March 2021 by the National Institute of Information and Communications Technology (NICT) in Tokyo, Japan.

235 Dr Rickards noted that Member Organizations of ICSU-WDS from wide-ranging fields are the building blocks of a worldwide ‘community of excellence’ for scientific data. Not only do these Members participate in advancing WDS goals; their data holdings, services, and products are the cornerstone of the federated data system. Currently, ICSU-WDS has 104 Member Organizations in four different categories (68 Regular, 10 Network, 8 Partner and 18 Associate Members).

236 Key ICSU-WDS activities include:

237 (i) ICSU-WDS and the Data Seal of Approval (DSA) Board announced (Nov 2016) the availability of their unified [Core Trustworthy Data Repository Requirements](#). This was developed through a DSA–WDS partnership Working Group within the Research Data Alliance (RDA). This catalogue of requirements will be used for the certification of WDS Regular Members as Trustworthy Data Repositories.

238 (ii) Four Working Groups—Bibliometrics, Cost Recovery, Services, and Workflows—were established under an umbrella Publishing Data WG and endorsed by RDA to address essential and practical issues in order to help enable the publication of research data as part of the scholarly record. The main objective being to identify and define best practices for publishing data and to test their implementation.

239 (iii) ICSU-WDS co-organised the International Data Week (11-17 Sep 2016) with CODATA—the Committee on Data of ICSU—and the Research Data Alliance (RDA), which attracted more than 850 data scientists, researchers, industry leaders, entrepreneurs, policymakers, and data stewards from all disciplines and from across the globe, including some from IODE.

ACTION: The Committee is requested to note the report of ICSU-WDS activities and achievements and consider how IODE can contribute to ICSU-WDS.

3.5.5 Research Data Alliance (RDA)

This agenda item was introduced by Ms Cyndy Chandler. She referred to [Document IOC/IODE-XXIV/3.5.5](#).

Ms Chandler explained that IODE is represented in the Research Data Alliance (RDA) by Cyndy Chandler (<http://orcid.org/0000-0003-2129-1647>). Concerns of interest to the oceanographic data community are discussed among members of the Marine Data Harmonization Interest Group (MDH IG) of which Chandler is a co-chair. The RDA MDH IG is a science-domain focused interest group whose members are actively engaged in the management of marine data and metadata, and similar related activities within existing networks of marine data centers/repositories. This interest group creates and tests marine data use-cases, and collects feedback from active marine data managers, researchers and other stakeholders to improve the maturity and robustness of the specifications and recommendations of the other relevant RDA Working Groups. A broader goal is to underpin improvements in marine data management in areas such as interoperability between relevant efforts in the marine domain. Since April 2015, the MDH IG has identified several key areas as being of interest to people responsible for stewardship of marine data. During the most recent IODE intercessional period the MDH IG has actively engaged with several other RDA groups, most notably: Brokering; Data Citation; Data Description Registry Interoperability; Data Foundation and Terminology; Data Publication; Data Type Registries; Fisheries Data Interoperability; Metadata Standards; PID Information Types; Practical Policy; Repository Audit and Certification DSA-WDS Partnership; Active Data Management Plans; Biodiversity Data Integration; Data Fabric; Domain Repositories; and Metadata and Persistent Identifiers (PID).

ACTION: The Committee is requested to comment on the work achieved and recommend further action

3.5.6 2nd International Indian Ocean Expedition (IIOE-2)

This agenda item was introduced by Ms Cyndy Chandler. She referred to [Document IOC/IODE-XXIV/3.5.6](#).

The IODE has provided initial support for data and information management activities for the nascent Second International Indian Ocean Expedition (IIOE-2). Information about the IOC endorsed global research program is available from the URL links above. Cyndy Chandler (co-chair of IODE) provided early guidance to the Interim Planning Committee in 2015. The IODE Secretariat and representatives of member states provided feedback to the planning committee drafting the IIOE-2 Implementation Plan. Members of IODE including Cyndy Chandler, Albert Fischer, Somkiat Khokiattiwong, Peter Pissierssens, Greg Reed, and Lucy Scott participated in several teleconferences during 2015 when the plan was being drafted. Ms Chandler, with support from the IODE Secretariat, drafted the section on Data and Information management. Peter Pissierssens attended the face-to-face Implementation Plan drafting workshop hosted at the Indian National Centre for Ocean Information Services (ESSO-INCOIS) in Hyderabad, India in October 2015. Ms Chandler and Mr Harrison Ong'anda of Kenya were selected to co-chair the Data and Information Management Working Group, one of seven that were formed in 2016 and contribute to the IIOE-2 Steering Committee.

ACTION: The Committee is requested to comment on the work achieved and recommend further action

[note: The Committee may establish a SWG on IIOE2 to discuss collaboration of IODE NODCs/ADUs in IIOE2]

3.5.7 Research Coordination Network (RCN): Sustained Multidisciplinary Ocean Observations (RCN:OceanObsNetwork)

This agenda item was introduced by Ms Cyndy Chandler, IODE Co-Chair. She referred to [Document IOC/IODE-XXIV/3.5.7](#) (RCN-OceanObsNetwork)

Ms Chandler explained that the OceanObs RCN (<http://sites.ieee.org/oceanrcn/>) was first funded in 2012 by the US National Science Foundation and is planned to continue for at least another five years.

She explained that the main objective of the OceanObs RCN is to evaluate the strategies by which relevant information about the ocean is made available in a timely manner to those who require it. The OceanObs RCN is especially interested in fostering collaboration with the IODE to promote: *“the importance of measuring life in the ocean (species, abundance productivity and how they are changing), concurrently with physical and chemical observations in support of a sustainable resource assessment, management, conservation, and use paradigm”*.

Ms. Chandler also reported that over the preceding five years the OceanObs RCN has fostered a broad, multi-disciplinary dialogue, enabling more effective use of ocean observing systems, consistent with national and international efforts, to inform societal decisions. The RCN has organized workshops for interdisciplinary exchanges and reviews of advanced research in ocean science with two to three meetings per year. Workshops have focused on interdisciplinary collaboration for monitoring of Essential Ocean Variables (EOV), specifically to promote the collection of physical, biogeochemical, and biological/biodiversity data to target problems of societal relevance. Early career professionals from the international community are actively invited to the annual RCN meetings. These meetings have been sponsored by the IOC's Global Ocean Observing System (GOOS), agencies including the National Science Foundation, NASA, NOAA, and professional societies such as the IEEE.

The leaders of the OceanObs RCN are interested in active collaboration with the IODE over the next intersessional period including activities intended to reach broader communities and address the emerging areas of biological and biodiversity observations in a multidisciplinary way. Potential synergistic RCN and IODE cooperative activities could include:

- Supporting OceanObs'19 (September 16-19, 2019, Hawaii)
- Supporting the objectives and activities of IODE
- Research, capacity building, technology development and technology transfer activities that address UN Sustainable Development Goals, and in particular SDG 14.
- Strengthening the collaboration between the Group on Earth Observations Marine Biodiversity Observation Network (GEO MBON), GOOS, and OBIS. The effort would deepen linkages with the GEO Blue Planet, AmeriGEOSS, AfriGEOSS, GEO-CCIOACZ, and other GEO elements, each of which includes extensive capacity building efforts.
- Promoting a culture of open data for sustained, operational observations about life in the ocean, concurrent with physical and biogeochemical

observations.

- Identifying the needs, opportunities and barriers to improved/expanded industry involvement in ocean observations, and develop the 'value proposition/business case' for this in collaboration with the private sector. Working with industry groups (e.g. WOC and PEMSEA) to ensure that ocean observations have broader impact and value, especially in the new blue economy.
- Considering the proposal of a 10-20 year cornerstone effort to measure life in the ocean, including developing the capacity, methods and technologies, in a manner consistent with physical and biogeochemical observations and to implement a global MBON, based on a collaborative effort between the IOC and GEO, and specifically between IODE/OBIS, GOOS, and MBON.

252 Ms Chandler noted that the final bullet (10-20 year cornerstone effort) would align well with the IOC Medium-Term Strategy proposed for 2014-2021. Also, she observed that the RCN could help to strengthen the connections between IODE, JCOMMOPS and GOOS.

253 Finally, Ms Chandler informed the Committee that the OceanObs RCN hosts annual workshops (often in December one day prior to the American Geophysical Union Meeting), and that summary reports from the workshops as well as workshop presentations are available online, and files can be downloaded from the RCN Web site (<http://sites.ieee.org/oceanrcn/>).

ACTION: The Committee is invited to:

- (i) provide feedback on the goals and activities of the RCN:OceanObsNetwork
- (ii) propose modalities for increased collaboration between IODE and RCN:OceanObsNetwork
- (iii) leverage the RCN working group structures to support studies that would further the mission and objectives of IODE
- (iv) support RCN:OceanObsNetwork activities by informing relevant organizations and projects within the Committee's networks of the RCN:OceanObsNetwork activities

254

3.6 PROGRESS REPORTS OF REGIONAL ACTIVITIES

255 This agenda item was introduced by Ms Cyndy Chandler, IODE Co-Chair.

3.6.1 ODINAFRICA

256 This agenda item was introduced by Mr Harrison Ong'anda. He referred to [Document IOC/IODE-XXIV/3.6.1](#).

257 He recalled that the fourth phase of ODINAFRICA project which ended in August 2016 was supported by the Government of Flanders. The achievements of this phase included the extension and strengthening of the network of marine scientists as well as ocean data and information managers, capacity development in

a wide range of aspects of data and information management, development of several products such as: AgriOcean/Dspace software and its use in developing OceanDocs database, the African Register of Marine Species, the SmartAtlas software and the related suite of African Coastal and Marine Atlases, the African node of the Ocean Data portal. He further informed the Committee on the results of the project on the “Review and Consolidation of ODINAFRICA Services and Products: 1989–2015 – ODINAFRICA Connect” that had been implemented in 2015-2016.

258 The Committee was informed of the relevant recommendations of the 4th Session of the IOC Sub-Commission for Africa which was held in Alexandria, Egypt between 6-8 March 2017.

ACTION: The Committee is requested to

(i) Review and comment on the achievements of ODINAFRICA, the challenges faced and the possible mechanisms for ensuring sustainability of the products developed in the different phases of the project.

(ii) Advise on development of follow-up activities that the institutions (or groups of institutions) in the network can work on together to sustain the ODINAFRICA network that now serves as a useful forum for bringing together marine science institutions and professionals in Africa.

259

3.6.2 ODINBLACKSEA

260 This agenda item was introduced by Murat Elge, Project Coordinator. He referred to [Document IOC/IODE-XXIV/3.6.2](#).

261 Mr Elge recalled that the ODINBLACKSEA Project was established during the The XIXth Session of the IODE Committee (Trieste, Italy, March 2007) through the Recommendation IODE-XIX.10 with the main objectives of increasing the collaboration amongst the Black Sea Nations and establishing a oceanographic data and information network in the Black Sea.

262 During the past intersessional period the following activities were implemented: (i) One Steering Committee (SC) Meeting was conducted between 28 September – 01 October 2015 in Varna/Bulgaria with the participation of representatives of all member states in the region. The SG Meeting was hosted by the Bulgarian Academy of Science; (ii) The Project Document dated March 2007 was revised for approval by the IODE Committee; (iii) Mr. Murat ELGE from Turkey was elected as the new Project Coordinator; (iv) Contact was established with the Commission on the Protection of the Black Sea Against Pollution (Black Sea Commission) about possible collaboration; (v) New Ukrainian NODC was established; (vi) Black Sea Nations’ Research Vessels Black Sea Cruise Plan for 2017 was prepared; (vii) Survey questionnaire about real-time stations in the Black Sea region was prepared

263 Mr Elge then introduced the action items to be conducted during the next inter sessional period of 2017-2019: (i) 2 SC Meetings will be held; (ii) 2 Capacity Building Activities will be held. (one ODP training in IOC Project office for IODE or in Russian NODC, one Data Management and Collection training in Turkish NODC); (iii) ODINBLACKSEA web site will be re-established and maintained; (iii) Research Vessel Work Plan Documents for 2018 and 2019 will be prepared; (iv) BlackSea Expedition Scientific document will be prepared; (v) The inventory of Databases and Meta-Databases of Member States will be prepared; (vi) Collaboration with Black Sea Commission through its Advisory Group on Information and Data Exchange; and

(vii) Provide assistance in the development, operation and strengthening of National Oceanographic Data (and Information) Centres and Associate Data Units (ADU) of Black Sea Countries and to establish oceanographic data and information network amongst them by applying IOC/IODE Ocean Data Portal (ODP).

264

ACTION: The Committee is requested to:

- (i) to adopt the revised project document**
- (ii) to decide to continue the ODINBLACKSEA project**
- (iii) to adopt the proposed work plan and budget**

3.6.3 ODINCARSA-LA

265 This agenda item was introduced by Mr Ariel Troisi, Project Coordinator. He referred to [Document IOC/IODE-XXIV/3.6.3](#).

266 Mr Troisi highlighted the activities implemented and results achieved during the inter-sessional period, including the participation in CMA2, SPINCAM and CLME projects.

267 Mr Troisi noted that despite the fact that the region continued suffering from extremely limited financial resources to support activities, the establishment of the OTGA RTC at INVEMAR, Santa Marta, Colombia, constituted an important turn of events as it provides a necessary hub for continuing capacity development in the region. Furthermore, the candidacy of Nova Southeastern University, Florida, USA, as RTC provides the necessary means to ensure CD activities for English speaking countries in the region.

268 An asymmetrical distribution of capacities in terms of human resources and infrastructure continues to be a challenge that requires, inter alia, support for the development of DM and MIM at basic and advanced levels including the development of products and services.

269 In line with the recommendations of the IODE XXIII Committee Meeting, closer contact was established with on-going projects that have a data and information management component or require data and information management expertise, as well as with the IOCARIBE Secretariat.

270 The direct link between IODE/ODINCARSA-LA and the GOOS GRA for the Tropical and Upper Southwest Atlantic (OCEATLAN) was strengthened and the IOC Manuals and Guides No. 73 was distributed as a guide for best practices.

ACTION: The Committee is requested to

- (i) Take note of, and comment on, the work accomplished**
- (ii) Approve the work plan and budget**

271

3.6.3.1 Caribbean Marine Atlas (phases 1 and 2)

272 This agenda item was introduced by Dr Francisco Arias, Project Coordinator. Dr Arias recalled that IOC/UNESCO, with financial support from the Government of Flanders and the Marine and Coastal Research Institute INVEMAR as project coordinator, are executing the Caribbean Marine Atlas project (phase 2). The main objective is the sustainable operationalization of an online digital technological

platform as a support of ICZM with special attention to: coastal hazards, climate change, biodiversity and habitats, fisheries, land-based sources of pollution, and Ecosystem-based Management for CLME. The online platform, based on GeoNode technology, has been implemented in selected countries for regional and national level consultation and decision making (<http://www.caribbeanmarineatlas.net/>). The project is working on 8 regional indicators according to national information (or regional), as well as on the publication of 10 thematic maps (Caribbean base, Bathymetry, Coral reef, Seagrasses, Mangrove, Marine Protected Areas, Biosphere Reserves, Hurricane track, Oceanography and meteorological stations, and Tools Management), which the national partners are currently reviewing to identify the sources of cartographic layers. The atlas currently has 178 thematic layers and 7 online maps, with documents, calendar, news and 35 special users to manage the countries' information, with INVEMAR support. The project has participated in several congresses, and published a note in the ICAN newsletter. There is a project flyer and a project brochure is being prepared as part of the project communication plan. Furthermore, inter-regional technical expertise exchange is taking place between CMA2 and ACMA (African Coastal and Marine Atlas). A proposal has been made to organize a short course on Geonode-CMA2 at the 28th International Congress for Conservation Biology (ICCB) (2017). In addition, an online training course is planned for technicians of the CMA2 country partners.

273 Dr Arias then highlighted the following achievements:

- 10 countries formally participating (marked *): *Barbados, *Belize, *Colombia, *Dominica, *Guatemala, *Jamaica, *Mexico, *Panama, Trinidad & Tobago, *Dominican Republic, Turks & Caicos and *Venezuela, and 2 more informally participating;
- Online technological platform active with potential for replication in several initiatives (ACMA; SPINCAM);
- 8 Indicators in implementation process (Coral Health, Marine and coastal protected areas, Sea level rise, Coastal population density, Fisheries total catch by country, Frequency magnitude and assessment of natural disasters impact, Threatened species and Invasive species);
- 10 Regional thematic maps in development process (Caribbean base map, Bathymetry, Coral reef, Seagrasses, Mangrove, Marine Protected Areas, Biosphere Reserves, Hurricane track, Oceanography and meteorological stations, and Tools Management);
- Events: CiiMAR-GoMC 12th Consortium of Marine Research Institutes of the Gulf of Mexico and Caribbean Sea on 2016 (Mexico), 2nd Coastal Area Integrated Management Ibero American Congress on 2016 (Brasil), Marine GIS course training as study case (2015 and 2016), Colombian events on environmental sector on 2016 and 28th ICCB on 2017.

ACTION: The Committee is requested to comment on the work achieved and to recommend any additional action.

274

3.6.3.2 CLME+

275 This agenda item was introduced by Ms Paula Sierra. Ms Sierra explained that the concept of Large Marine Ecosystems (LME's) has been proposed by NOAA, and has subsequently been adopted by the Global Environment Facility (GEF), as a meaningful geospatial unit to promote an ecosystem approach to the management of shared marine resources. With the financial support of the UNDP/GEF "CLME+ Project", and in collaboration with several partner agencies including IOCARIBE (IOC

of UNESCO), UNEP CEP and FAO-WECAFC, member countries jointly delivered a 10-year Strategic Action Programme (SAP) “for the Sustainable Management of shared Living Marine Resources” for the Caribbean and North Brazil Shelf LME’s (these LME’s are now further jointly being referred to as the “CLME+ region”). Subsequent to the collaborative development of the SAP (2012-13) and its region-wide technical clearance (2013), the “CLME+ SAP” (2015-2025) has been endorsed at the political level: to date (February 2017), the SAP has been signed by a total 34 Ministers with portfolios relating to environment, fisheries, and foreign affairs. Jointly, these Ministers represent 25 countries from the CLME+ region. The CLME+ SAP therefore now provides a formally adopted common roadmap for CLME+ countries, and the main regional coordination mechanism to deliver against marine-related international environmental and development targets in the CLME+ region, such as the Aichi Targets and the UN Sustainable Development Goal 14.

276 SAP implementation is now being catalyzed through a new UNDP/GEF Project, the “CLME+ Project” (2015-2020), for which the IOC of UNESCO acts as a Co-executing Partner. Successful implementation of the CLME+ SAP requires the implementation of a SAP Monitoring & Evaluation mechanism, with geospatial component.

277 It is in this context that support is being provided by the IODE of UNESCO, through the FUST/IOC of UNESCO “Caribbean Marine Atlas – Phase 2” (CMA2) Project. Under this project, technically implemented by INVEMAR, Colombia, financial support for the amount of USD 180.000 is provided by the IOC of UNESCO to the UNOPS-run CLME+ regional Project Coordination Unit through a UN-to-UN Agreement, enabling the co-financing of the position of the CLME+ “Environmental Mapping & Reporting Specialist” (EMRS) over the 2016-2018 period.

278 With CMA2 and CLME+ sharing the objective of providing better information for decision-makers to support successful SAP implementation, the EMRS acts as the technical liaison between the INVEMAR CMA2 and UNOPS CLME+ teams, and their partner organizations.

279 The EMRS is coordinating efforts towards SAP M&E institutionalization with a wider number of regional organizations with a mandate for the marine environment, including: UNEP CEP, FAO-WECAFC, UNDP, IOCARIBE, CRFM, OSPESCA, OECS and IODE, among others. It is expected that Member States of this organizations will endorse the M&E mechanism during their inter-governmental meetings.

280 In this context, EMRS will be coordinating the development of a region-wide reporting mechanism on “the State of the Marine Environment in the CLME+ region”, with associated supporting data portals. IODE support, through INVEMAR, therefore includes the development and implementation of the Geonode technology for the Caribbean Marine Atlas – CMA (amount unknown to me, to be provided by IODE or INVEMAR). EMRS and INVEMAR will work closely on the publication of SAP-relevant geospatial information in the CMA.

ACTION: The Committee is requested to comment on the work achieved and to recommend any additional action.

281

3.6.4 ODINCINDIO

282 This agenda item was introduced by Ms Cyndy Chandler, Co-Chair. Ms Chandler recalled that IOCINDIO had been established as the IOC Regional Committee for the Central Indian Ocean in 1982. The 4th Session of IOCINDIO (December 2005) had discussed the ODINCINDIO project proposal which was proposed by the 17th Session of the IODE Committee (2003). The proposal was also

accepted by the IOGOOS as a capacity building tool and it was also supported by ROPME. Unfortunately, since 2005 the IOCINDIO activities were implemented very slowly and there were no sessions of IOCINDIO until the 5th Session, held in Chennai, India, 25-27 April 2016. Similarly, no actions were taken regarding the implementation of ODINCINDIO. In February 2012, the IODE Officers called on IOCINDIO Member States to more actively participate in realizing ODINCINDIO. At the EC-XLI (June 2012) Thailand and India urged the IOC Secretariat to support and help re-activate IOCINDIO. Since then the Islamic Republic of Iran established a UNESCO Category II Centre on ocean and coastal zone research and training for the Persian Gulf and the Oman Sea. In January 2013 IOC Circular Letter 2467 (Data and Information Survey in the Area of the Persian Gulf and Oman Sea) called on all Member States of the IOCINDIO region to (i) provide information on sea and coastal research institutions, ocean data centres and marine libraries in their country; (ii) provide information on sea and coastal research and observations experts, data management experts and marine librarians; and (iii) expression of interest to participate in discussions on the possible establishment of a sub-regional Ocean Data and Information Network for the Persian Gulf and Oman Sea region. Only two member states responded to the Letter.

283 At IODE-XXIII lack of progress was reported again. Saudi Arabia, India and Thailand expressed interest in the continuation of the ODINCINDIO project. The Committee then requested interested Member States to meet on an *ad hoc* basis and to propose a way forward. The Committee had further recommended that a scientific conference be held in the region as an effective way to revive ODINCINDIO. India offered to host such a conference, relating the event to the IIOE2. While IIOE2 has since started no specific actions related to ODINCINDIO have been undertaken.

284 As mentioned the 5th Session of the IOCINDIO was held in April 2016. The Executive Summary of the meeting ([Document IOC/IOCINDIO-V/3s](#)) makes no reference to ODINCINDIO or any capacity development requirements or other activities related to ocean data and information management and exchange.

285 It was further noted that Mr Peter Pissierssens had participated in the “2nd Annual Marine Data Infrastructure GCC 2017”, Dubai, 30-31 January 2017 where the need for guidelines as well as training in data quality control, data policy and other data management procedures had been expressed. This would be further discussed at IOCINDIO-VI.

286 It was noted that the 6th Session of IOCINDIO was planned to be held in Kuwait between 10-13 April 2017. Requirements related to oceanographic data and information management and exchange may emerge from that meeting. That information will be conveyed to the IODE Officers.

ACTION: The Committee is requested to comment and advise on future actions (Officers could be tasked to assist with a preliminary work plan based on requirements expressed by IOCINDIO-VI).

287

3.6.5 ODINECET

288 This agenda item was introduced by Ms Linda Pikula on behalf of Ms Olga Akimova, Project Coordinator. She referred to [Document IOC/IODE-XXIV/3.6.5](#).

289 In her presentation, she recalled that the project aims at assisting marine libraries in European Countries in Economic Transition and during the inter-sessional period 2015-2017 the following activities were implemented: (i) Meeting of the ODINECET Steering Group was held in Rome, Italy 7th and 11th September, 2015. (ii) Koha electronic catalogue was developed and hosted now at Cloud technologies

<http://marine-research.org/>. IODE allocated funding for Koha implementation in 2015. Future designing is still needed. (iii) A webserver where IBSS and CEEMaR repositories were existed was broken when the Crimea has switched to autonomous reserve power after transmission towers in the adjacent Ukrainian Kherson region were put out of commission, causing a blackout. This happened on 21 November 2015. After some efforts to recover webserver it was found inoperative. In November 2016, the Institute (IMBR) acquired a new powerful webserver and uploading of backups of IBSS and CEEMaR Repositories is expected. (iv) Other ODINECET initiatives and projects are under elaboration and implementation.

ACTION: The Committee is requested to comment on the work achieved and to consider the proposed work plan and budget for the next inter-sessional period.

290

3.6.6 ODINWESTPAC

291 This agenda item was introduced by Dr Yu Ting (representing Dr Shi Suixiang, Project Coordinator of ODINWESTPAC), referring to [Document IOC/IODE-XXIV/3.6.6](#).

292 She reported that the side meeting of ODINWESTPAC took place on May 14, 2015 during IOC/WESTPAC-X (12-15 May 2015) in Phuket, Thailand, and the First Session of the Advisory Group for ODINWESTPAC was held in Tianjin, China, 27-28 January 2016, co-sponsored by the Government of China. Dr Yu Ting on the following results achieved during the inter-sessional period: (i) web site developed (<http://www.odinwestpac.org>); (ii) regional data and information products updated; (iii) collaboration with other projects on enhancing the regional capacity building activities. She further reported vision on developing the Project by initiate R&D on regional climate statistical and ocean reanalysis products, collaboration on sea level rising assessment and sharing the best practice on Blue Economy classification standards and statistical methodology. ODINWESTPAC will organize a Regional workshop in May 2017, to demonstrate the advantages, cost/benefit and products that can be derived from national oceanographic data management facilities and also from the well operation of ODINWESTPAC.

293 The Committee was further reminded that ODINWESTPAC had, to date, not been formally established as an IODE Project and the Committee was invited to do so.

ACTION: The Committee is requested to:

(i) comment on the work achieved and to consider the proposed work plan and budget for the next inter-sessional period .

(ii) formally establish ODINWESTPAC as a project through a [Recommendation](#).

294

3.6.7 Other

295 This agenda item was introduced by Ms Cyndy Chandler. She invited the Committee to intervene on any other regional activities or issues that require the Committee's attention.

296

ACTION: The Committee is requested to intervene.

3.6.7.1 IIOE-2: see 3.5.6

4. IODE CAPACITY DEVELOPMENT

297 This agenda item was briefly introduced by Prof Yutaka Michida, Co-Chair.

4.1 THE IOC CAPACITY DEVELOPMENT STRATEGY

298 This agenda item was introduced by Mr Peter Pissierssens. He referred to [Document IOC/IODE-XXIV/4.1](#) and [Document IOC/INF-1332](#).

299 Mr Pissierssens recalled that the 27th Session of the IOC Assembly (2013) established (through Decision IOC-XXVII/Dec.5.5.1) an Intersessional Working Group for Developing a Draft Strategic Plan for Capacity Development. It tasked this Group to develop a Capacity Development (CD) Strategic Plan for IOC. This plan would then be implemented through partnership with Member States, donors, UN Agencies, global financial institutions and the private sector. Initially the Group was instructed to submit its work to the 47th Session of the IOC Executive Council in 2014. The IOC Executive Council, at its 47th session, noted that the work was not completed and, through Decision EC-XLVIII/Dec. 6.1, had decided to reconstitute the Intersessional Working Group for the IOC Capacity Development Strategy and had instructed the Chair of the Group (prof. Adoté Blivi) to submit the final draft of the IOC Capacity Development Strategy and associated documentation to the 28th Session of the Assembly (2015). The IOC Assembly, at its 28th Session (2015) adopted the Strategy through Resolution XXVIII-2 (IOC Capacity Development Strategy (2015–2021) which was subsequently published as IOC/INF-1332.

300 The strategy contains a vision statement (Through international cooperation, IOC assists its Member States to collectively achieve the IOC'S high-level objectives (HLOs), with particular attention to ensuring that all Member States have the capacity to meet them) as well as a mission statement (The IOC will undertake relevant actions to assist Member States with developing and sustaining the necessary capacity to undertake activities necessary to achieve the IOC vision at the national level as well as at the international cooperation level.)

301 The activities and actions undertaken by the IOC within the framework of targeted capacity development will result in several outputs that, through their use by Member States should result in desired “changes” at the national and sub-regional level in areas such as decision-making, policy, governance, and knowledge.

302 A total of **six expected outputs** are identified. They all need to be addressed on a long-term and sustained basis: (i) Human resources developed; (ii) Access to physical infrastructure established or improved; (iii) Global, regional and sub-regional mechanisms strengthened; (iv) Development of ocean research policies in support of sustainable development objectives promoted; (v) Visibility and awareness increased; and (vi) Sustained (long-term) resource mobilization reinforced.

303 The 28th Session of the IOC Assembly stated that, by the 29th Session of the IOC Assembly, IOC Primary Subsidiary Bodies (global programmes and Regional Subsidiary Bodies) should take the following actions: (i) develop programmatic and regionally relevant capacity development work plans based on this strategy and related needs assessments conducted in a consistent manner, building on ongoing activities and making use of existing training and education facilities; (ii) mobilize

resources in order to reinforce the Secretariat staffing of the regional Sub-Commissions, other subsidiary bodies and global programmes; (iii) catalyze capacity development through global, regional, and national programme development, including projects prepared in consultation with Member States with a view to raise extra-budgetary resources; and (iv) enhance collaboration and communication between its global programmes and Regional Subsidiary Bodies, to contribute to (i) and (ii) above.

304 The IOC CD coordinator invited all IOC global programmes (including IODE) as well as the three IOC regional sub-commissions to describe how they currently achieve the six outputs through targeted activities and actions. Document IOC/IODE-XXIV/4.1 provides an overview of the responses received and includes a gap analysis showing which actions are currently not performed at the global as well as regional level.

305 The analysis allows us to draw the following conclusions: (i) Neither at the global or regional level is there currently collaboration with UNESCO Chairs; (ii) The most frequently occurring programmatic gaps under “human resources development” relate to “mentoring”, “young scientists award” and to a lesser extent the lack of a “travel grant fund”; (iii) Under “access to physical infrastructure” there is an overall lack of a “register of infrastructure to facilitate access”; (iv) While all regions report activities under “Assist Member States with the development of marine science management procedures and national policies” this does not seem to be addressed by IODE at the global level. This is important considering the IOC priority on SDGs.

ACTION: The Committee is requested to:

- (i) **approve the content of Document IOC/IODE-XXIV/4.1 for its inclusion in the overall IOC CD strategy implementation working document that is being prepared for the upcoming 29th Session of the IOC Assembly;**
- (ii) **consider the identified CD gaps in the capacity development work plan for the next inter-sessional period. The Committee may establish a sessional working group on the IODE CD implementation plan and/or Task Team**

306

4.2 IMPLEMENTATION OF THE IOC CAPACITY DEVELOPMENT STRATEGY BY IODE

4.2.1 Progress Report on the IODE OceanTeacher Global Academy project

307 This agenda item was introduced by Ms Claudia Delgado (or Chair SG-OTGA). She referred to [Document IOC/IODE-XXIV/4.2.1](#)

308 Ms Claudia Delgado recalled that two OTGA SG Meetings took place during the inter-sessional period. The 3rd OTGA SG meeting took place in Ostend, Belgium (IODE PO) between 21-24 February 2017.

309 She informed the Committee that during the inter-sessional period all candidate RTCs started developing the workplan. Four (4) RTCs achieved ‘Designated’ status given the positive performance (Colombia, India, Kenya, Malaysia), while the other RTCs kept the ‘Candidate’ status (Senegal, Mozambique, China). Two (2) candidate RTCs left the OTGA network due to unforeseen difficulties in developing the workplan (South Africa, USA). A new candidate/observer RTC (INIOS-Iran) was

assessed in August 2016 and attended the 3rd OTGA SG meeting as an observer.

310 She further noted that during the inter-sessional period 30 training activities were organised and/or supported by OTGA. She will further inform that a total of twenty seven (27) new training courses were uploaded on the OT e-LP, in 4 different languages (English, French, Spanish and Portuguese). Meanwhile, the OT website and OT e-LP were completely redesigned, as well as the application process, which is now fully online.

311 She informed the Committee about the workplan agreed upon by the OTGA SG until December 2018.

312 She further informed that given the extra workload under the new OTGA structure, Mr Greg Reed was hired as a consultant and tasked to develop new training resources on Ocean Data Management as well as designing a Quality Management Framework for OTGA.

313 She recalled that the OTGA is an extra budgetary Project funded by FUST (Government of Flanders. Kingdom of Belgium) ending in December 2018.

ACTION: The Committee is requested to:

(i) comment on the work achieved and to consider the proposed work plan and budget for the next inter-sessional period.

(ii) consider the development of a proposal for follow-up to OTGA project (through task team or SWG or through SG-OTGA) and possibly recommendation

314

4.2.2 Other IODE Capacity Development activities

315 This agenda item was introduced by Ms Claudia Delgado. She will refer to [Document IOC/IODE-XXIV/4.2.2.](#)

316 Ms Claudia Delgado recalled that IODE has built a comprehensive Learning Management System (OceanTeacher) that, in combination with classroom training, has trained nearly 2000 students from 120 countries since 2005. This success demonstrates the expertise within IODE and its potential to expand the use of this methodology to other IOC programmes.

317 She informed the Committee that the OTGA Project is able to complement other existing training programmes of the IOC and make the OceanTeacher e-Learning Platform widely available, thus benefiting all IOC Member States with special emphasis on developing regions.

318 The regional implementation methodology will allow the training programmes to become self-driven with great attention to local requirements, language and culture. Equally substantial attention is given to local ownership as the Regional Training Centres (RTCs), supported by the host countries. In addition, the OceanTeacher Global Academy validates the expertise available in developing regions and promotes their self-reliance in terms of specialized technical training and higher education related to ocean science, observation and data/information management.

319 She informed the Committee that during the inter-sessional period sixteen (16) training activities and workshops were jointly organized with other IOC Programmes and/or other external/partner organisations. Support consisted mostly, although not exclusively, on hosting training resources on the OT e-Learning Platform. She will inform that this support is done without extra financial support.

320 The first "Regional Training Course for Pacific Small Island Developing States on the Conduct of Marine Scientific Research under the United Nations Convention

on the Law of the Sea” was organized jointly by IOC and DOALOS in partnership with the Pacific Community (SPC) European Union supported Deep Sea Minerals Project and the Korea Maritime Institute (KMI) in Busan, Republic of Korea. IODE provided instruction on the assessment and management of data and sharing of data. The second Regional training course is planned for 2017 for Caribbean Small Island Developing States.

321 She further informed the Committee about activities planned for 2017-18.

ACTION: The Committee will be invited to comment on the on-going and proposed cooperation opportunities, and further suggest other possible collaborations (both organisations and potential training topics) for the next inter-sessional period.

322

4.2.2.1 UNCLOS/BBNJ

323 This agenda item was introduced by Mr Ward Appeltans/ Mr Ariel Troisi.

324 The United Nations General Assembly (UNGA resolution 69/292 on 19 June 2015) established a Preparatory Committee (PrepCom) on the development of a new legally-binding instrument under the UN Convention on the Law of the Sea to conserve and sustainably use marine biodiversity of areas beyond national jurisdiction (BBNJ).

325 The 49th IOC Executive Council (June 2016) established an Intersessional Working Group (IWG) on the IOC relevant issues related to the PrepCom with the tasks to examine the possible contribution of the IOC in relation to BBNJ, particularly in areas related to marine scientific research, capacity development and transfer of marine technology, as well as data and information management, with a view to informing the participation of the IOC representative in the BBNJ process. The IWG has representatives from 25 Member States.

326 There is general agreement in the IWG that data management and data exchange constitute one of the areas of IOC’s potential contribution to BBNJ. IODE and OBIS are regarded to be uniquely positioned to provide expertise in data curation, data integration, standards and open and free access to data, information, data products and services. It is also pointed out that capacity development on data standards, metadata and best practices is of great importance. Nevertheless, there is a call for a seamless query of associated data from other global repositories.

327 The creation of new mechanisms or structures with similar functions and roles should be avoided. However, some IWG members pointed out that both IODE and OBIS would require additional resources both in terms of financial and human. In addition, as for areas or topics for improvement, the IWG raises the need to improve the awareness of IODE and OBIS work, services and potential, as well as a widespread promotion to encourage submission of data to existing repositories. Some Member States indicated that interaction with user communities should be pursued, while others indicated the importance of capacity development.

328 The IODE Steering Group for OBIS also discussed the potential role of OBIS in BBNJ and concluded that OBIS could provide foundational technology and methodology for robust data integration, products, and services, and in fundamentally being a science mission can serve as a neutral party with regard to laws and regulations. However, while OBIS already provides much of the capability that a BBNJ data system can use, there are several areas that would require supplemental funding to focus on BBNJ-specific needs. The OBIS network, both applicable nodes providing data from areas beyond national jurisdiction and the international OBIS secretariat, will need to be further expanded with new resources

to address the specific requirements for using OBIS in a legal instrument context. Increased scrutiny needs to be applied to flag data appropriate or inappropriate for specific uses in consultation with legal experts and communicate uncertainty in ways consumable by non-scientist users. In addition, support for developing training packages and for organizing training workshops will also be needed. The SG-OBIS identified that the OBIS secretariat will require up to 3 extra staff members for coordination, training and product development as well as funding to assist the deep-sea and other key OBIS Nodes through a targeted funding program.

ACTION: The Committee is requested to:

- (i) comment on the work achieved period.**
- (ii) encourage IOC Member States to continue assisting in the support of the contributing national, regional and thematic OBIS nodes, which they host, that contribute data, technical infrastructure and scientific expertise that can support the BBNJ and other relevant international processes**

329

5. IODE COMMUNICATION AND OUTREACH

5.1 REPORTS ON COMMUNICATION AND OUTREACH ACTIVITIES DURING THE PAST INTER-SESSIONAL PERIOD

330 This agenda item was introduced by Mr Yutaka Michida, Co-Chair. He invited the Committee to report on communication and outreach activities they organized during the inter-sessional period with the objective of promoting IODE and its activities.

5.2 IOC COMMUNICATION AND OUTREACH STRATEGY FOR DATA AND INFORMATION MANAGEMENT: see 6.3

6. THE FUTURE OF IODE

331 This agenda item was briefly introduced by Ms Cyndy Chandler, Co-Chair.

6.1 REPORT OF THE INTER-SESSIONAL WORKING GROUP TO PROPOSE A RE-STRUCTURING OF IODE

332 This agenda item was introduced by Mr Hernan Garcia, Chair of the group. He referred to [Document IOC/IODE-XXIV/6.1](#).

333 Mr Garcia recalled that at IODE-XXIII (agenda item 6.2.1: review of current projects and agenda item 3.3: project reports) the Committee had recommended to consider whether the current large number of projects, both global and regional, could continue to be coordinated by IODE national experts and the IODE Secretariat.

While extensive discussions had been held at the Session on reduction of the number of projects, the Committee had not been able to reach a consensus on restructuring of IODE and had decided that the matter needed further study. Accordingly, through Decision IODE-XXIII.1 the Committee had established an inter-sessional working group to examine options for enhancing and possibly restructuring IODE to achieve an efficient and optimal use of human and financial resources and better communications of IODE activities to our partners and stakeholders. The Group had been given the following objectives: (i) Review the recommendations listed in Document IOC/IODE-XXIII/5b (The Future of IODE – Recommendations); (ii) Review the terms of reference for the IODE structure, projects, and activities to ensure continued relevance to IODE and IOC goals; (iii) Identify and evaluate the benefits IODE derives from the current structure, projects and activities; (iv) Evaluate any weaknesses of the current IODE structure, projects and activities and formulate ways to remedy these weaknesses; (v) Propose options for revising the current structure, projects and activities. The group was requested to work by email and to submit its document by December 2016. Its membership included 21 experts from 19 Member States and was Chaired by Mr Hernan Garcia (USA, replacing Ms Margarita Gregg) and Mr Yutaka Michida (Japan).

334 Mr Garcia informed the Committee that the document produced by the inter-sessional working group provides proposals accompanied by success metrics, implementation plan, and risk-benefit considerations responsive to the evolving needs of the IODE ocean data and information community.

335 The document recommends (a) instituting a peer-reviewed and merit-based funding cycle process for IODE projects and activities and (b) establishing a new IODE Management Group representing the broad IODE data and information objectives to recommend, to execute, and to track approved IODE committee work plans.

336 The document further recommends that IODE should focus on relevant and doable strategies that lend themselves to achieving incremental and tangible progress over the next intersessional periods. It also recommends that IOC/IODE provides recognition to the IODE individuals that provide their time voluntarily to help implement IODE work plans with the consent of their host institutions.

337 In addition, the document provides strategic plan suggestions for the attention of the IODE Inter-sessional working group to revise the IOC Strategic Plan for Oceanographic Data and Information Exchange (Decision IODE-XXIII.2).

338

ACTION: The Committee is requested to review and adopt the recommended actions to revise the current IODE structure, projects and activities:

(i) IODE management structure: establishment of the IODE Management Group; [Recommendation]

(ii) IODE pilot projects, projects, activities, operational programmes; evaluation criteria, performance management [Recommendation]

6.1.1 New IODE structural elements: Associated Information Units (AIU)

339 This agenda item was introduced by Ms Linda Pikula. She recalled the success of the Associated Data Units and pointed out the synergy in implementing a complementary structure of Associated Information Units. She noted the IODE lack of channels of direct communication with individual marine science libraries and information centres leading to minimal engagement with the marine information community. She further highlighted the mutual benefits to both IODE and the

proposed AIUs of this new IODE structural element.

340 She then briefly introduced draft [Recommendation/Decision IOC-XXIV/6.1.1](#)
(ASSOCIATED INFORMATION UNITS (AIUs)).

341

ACTION: The Committee is requested to consider and adopt
[Recommendation IOC-XXIV/6.1.1](#)

6.2 REPORT OF THE INTER-SESSIONAL WORKING GROUP TO REVISE THE IOC STRATEGIC PLAN FOR OCEANOGRAPHIC DATA AND INFORMATION EXCHANGE

342 This agenda item was introduced by Dr Lesley Rickards, Co-Chair of the group.
She referred to [Document IOC/IODE-XXIV/6.2](#). She recalled that IODE-XXII
submitted a Draft Decision for the 27th Session of the IOC Assembly (June 2013),
which was adopted. Subsequently the IOC Strategic Plan for Oceanographic Data
and Information Exchange (2013-2016) was published as IOC Manuals and Guides
No. 66. IODE XXIII established an inter-sessional working group to update this
Strategic Plan.

343 The vision is to achieve “A comprehensive and integrated ocean data and
information system, serving the broad and diverse needs of IOC Member States, for
both routine and scientific use.” The Strategic Plan has been developed to support
the IOC Vision and High-Level Objectives for 2014–2021 (IOC Medium-Term
Strategy).

344 The concept of delivering a data and information service for the “global ocean
commons” (i.e. global public good) is central to this vision. The objectives of the
Strategic Plan are to:

- (i) Facilitate and promote the exchange of oceanographic data and information in
compliance with the IOC Oceanographic Data Exchange Policy;
- (ii) Deliver a comprehensive distributed data system that can receive data collected
by all IOC programmes and projects and deliver them in a uniform and
transparent way to all users;
- (iii) Deliver a system that can collect bibliographic and factual information from all
IOC programmes and projects and deliver them in a uniform and transparent way
to all users; and
- (iv) Ensure alignment with, and contribution to, both the IOC’s Medium Term Strategy
for 2014-2021, and with the UN’s 2030 Agenda for sustainable development, in
particular the dedicated sustainable development goal for the ocean (Conserve
and sustainably use the oceans, seas and marine resources for sustainable
development).

345 The IOC Data and Information Management System resulting from this strategy
will deliver:

- (i) Assembled, quality controlled and archived data on a diverse range of variables
according to scientifically sound and well-documented standards and formats;
- (ii) Timely dissemination of data on a diverse range of variables (observations and
model outputs) both on real-time and delayed modes depending on the needs of
user groups and their technical capabilities (automatic dissemination as well as
“on demand”); and

(iii) Easy discovery and access to data and information on a diverse range of variables and derived products (including forecasts, alerts and warnings) by users who have a broad range of capabilities.

346 Five expected outputs are identified in the Strategic Plan that aim to strengthen existing data and information systems:

1. Improved ability to integrate regional and global data systems.
2. Improved capability and functionality of systems in the centres managing oceanographic data and information.
3. Promote free and open access to oceanographic data and information and adherence to IOC Oceanographic Data Exchange policy.
4. Address the needs of both the scientific users and society at large for the demand for access to quality data and information.
5. Strengthened capacity to manage oceanographic data and information.

347 These five outputs will be achieved through targeted activities and related actions.

348 The implementation of the Strategic Plan will be the responsibility of the IOC Strategic Plan for Data and Information Management Advisory Group.

ACTION: The Committee is requested to recommend to the IOC Assembly, for adoption, the IOC Strategic Plan for Oceanographic Data and Information Exchange (2017-2021)[Recommendation]

349

6.2.1 Follow-up to the audit of the IOC

350 This agenda was introduced by Mr Tobias Spears, ODP project manager. He informed the Committee that a team of three auditors conducted an audit of the Intergovernmental Oceanographic Commission (IOC) from 11 to 24 April 2016. Samples of the accounts and documentation of the IOC were examined and open interviews were conducted with the senior staff members of the Commission and several representatives of Member States.

351 The audit resulted in 15 recommendations, which would be submitted to the IOC Assembly in June for further action (and to UNESCO). Recommendation 15 relates to IODE: ***"The External Auditor recommends that a draft resolution be submitted to the IOC Assembly calling for Member States to work together, with the support of IOC, to construct a universal information system and ocean data portal, along with a cost-benefit analysis prepared in advance by the IODE project."***

352 The recommendation had been drafted based upon the following elements:

353 (i) There is no common database for all marine sciences, which is certainly unattainable when one considers the amount, complexity and heterogeneity of the information to be assembled, but there is also no common portal for all marine sciences that connects all websites and relevant disciplines through web links

354 (ii) This array of data and information reflects the diversity of the stakeholders, the complexity of the subjects, the variety of material and the obsolescence of several systems. For its users, it appears to be part of the avowed landscape of marine science. For the outside observer, it seems to be the product of historical, technical, organizational, and disciplinary build-up, rather than the result of rational construction. This is even more evident as programmes like the International Oceanographic Data and Information Exchange (IODE) have existed for more than

50 years, with the express goal of encouraging the exchange of data, at least of metadata, between the different counterparts of oceanographic disciplines.

355 (iii) Naturally, the diversity of subjects (physics, chemistry, biology, climate, ecosystems, health, etc.) and the disparity of the information technology used are also obstacles to putting them in perspective. Similarly, geostrategic and legal considerations may also be obstacles to pooling these systems. Lastly, typical sociological obstacles to information sharing or frequently used methods are also probably responsible. It remains the case that – at a time when the Member States, United Nations bodies, and various stakeholders in the fight against climate change and environmental conservation expect reliable, universal and up-to-date information from marine science – this wide variety of data and information systems seems outdated.

356 (iv) This dispersal of systems has naturally drawn the attention of some of its Member States. Thus, a Russian initiative, led by the All-Russian Research Institute Hydrometeorological Information at Obninsk, aims to develop an ocean data portal. For its part, the European Union has launched a marine data research project. Finally, the United States of America has a longstanding commitment to collect historic ocean data. In all three cases, the involvement of IOC is unclear and these initiatives seem to be in competition with each other rather than coordinated.

357 (v) This state of affairs goes beyond the scope of this audit, but we cannot help thinking that the Commission would perform its role well if its Assembly adopted a resolution promoting the construction of a universal information system and ocean data portal, taking into account current environmental, climate-related and sustainable development issues. Such an undertaking would increase the renown and visibility of IOC.

358 (vi) It could be useful to approach businesses that sell data to firms in need of information on the ocean (oil companies, ship owners, fisheries, etc.) to potentially receive sponsorship from such firms for the development of a common portal on all ocean-related matters.

359 The auditors have clearly identified the lack of coordination between various regional and international initiatives that relate to the development of a “global oceanographic data portal” and while this coordination clearly fits within the remit of IOC and its IODE, reality is different.

ACTION: The Committee is requested to consider Recommendation 15 of the IOC audit and to formulate a recommendation to the IOC Assembly to construct a universal information system and ocean data portal.

The Committee is further requested to consider the drafting of a “cost-benefit analysis” document which expresses the advantages/benefits of such a global system and may be submitted to the 2018 IOC Executive Council.

[Recommendation]

360

6.3 REPORT OF THE INTER-SESSIONAL WORKING GROUP TO CREATE AN IOC COMMUNICATION AND OUTREACH

STRATEGY FOR DATA AND INFORMATION MANAGEMENT

361 This agenda item was introduced by Ms Pauline Simpson, Co-Chair of the group. She referred to [Document IOC/IODE-XXIV/6.3](#). She will recall that the main task of the Inter-Sessional Working Group was to create an IOC Communication and Outreach Strategy for Data and Information Management whose objective is better communication of IODE activities to partners and stakeholders by defining a robust framework for communication and outreach activities, placing the global and regional presence of IODE at the forefront of coastal and marine knowledge management. (Decision IODE-XXIII.3 http://www.iode.org/index.php?option=com_content&view=article&id=289&Itemid=100017#decision23.3)

362 She reported that from May 2015 she has produced incremental drafts which have been circulated to a small review group: Sissy Iona; Greg Reed. She noted that the Communication Strategy implementation plan is organic and will need to be reviewed/evaluated at each IODE Committee session. She reminded the Committee of the IOC Communication Advisory Report 2016 and the need for IODE to take advantage of the proposed IOC Communication Manager appointment

363 Due to the small review group Ms Simpson requested that a Sessional working group to review the IODE Communication Strategy be created. Any comments/edits from this WG have been incorporated in the final draft for approval.

364

ACTION: The Committee will be requested to:

(i) Approve the IOC (IODE) Communication and Outreach Strategy for Data and Information Management by a [Decision](#)

7. INTRODUCTION TO WORK PLAN AND BUDGET (FINANCIAL RESOURCES 2017-2019)

7.1 UNESCO REGULAR PROGRAMME FINANCIAL RESOURCES REMAINING FOR 2017 AND EXPECTED FOR THE BIENNIUM 2018-2019

365 This agenda item was introduced by Mr Peter Pissierssens. He informed the Committee that the 2016-2017 (38 C/5) UNESCO regular programme budget provided funding to IODE through 3 expected results (ER):

366 (i) ER 4: Scientific understanding of ocean and coastal processes bolstered and used by Member States to improve the management of the human relationship with the ocean:

367 (ii) ER 5: Risks and impacts of tsunamis and other ocean-related hazards reduced, climate change adaptation and mitigation measures taken, and policies for healthy ocean ecosystems developed and implemented by Member States

368 (iii) ER 6: Member States' institutional capacities reinforced to protect and

sustainably manage ocean and coastal resources

369 This resulted in three budgetary allocations:

370

	2016	2017	Total
IODE & OBIS core systems:	47,565	47,565	95,130
IODE & OBIS products and services	21,953	21,952	43,905
IODE & OBIS training and education	45,000	45,000	90,000
Totals	114,518	114,517	229,035

371 It was noted however that funds were already spent on preparation for IODE and on-going commitments. Accordingly, Mr Pissierssens reported that the real funds available for 2017 from the UNESCO RP would be around US\$ 100,000 (three allocations combined)

372 For the next biennium (2018-2019) the exact allocations were not yet known but it was expected that some cuts would be made, possibly reducing the total allocation by 10% (probably approx. \$103,500 if the 518M scenario is adopted). Mr Pissierssens recommended that the sessional working group on work plan and budget should take into account the expected cuts when preparing the draft work plan and budget for the next inter-sessional period.

7.2 EXTRA-BUDGETARY RESOURCES REMAINING FOR 2017 AND EXPECTED FOR THE BIENNIUM 2018-2019

373 This agenda item was introduced by Mr Peter Pissierssens. He informed the Committee that the following extra-budgetary projects were currently on-going:

Project Title	Funding source	Starting date	Ending date	Allocation 2017	Allocation 2018	Allocation 2019
OceanTeacher Global Academy	Flanders	May 2014	December 2018	829,000	829,000	0
Caribbean Marine Atlas Phase 2	Flanders	May 2014	December 2018	239,000	253,000	0
DIPS-4	Flanders	May 2014	December 2017	228,500	0	0
ECOPOTENTIAL	European Commission	June 2015	May 2019	154,300	154,300	0

374 He noted that, in addition to the above-mentioned project funds, the IOC Project Office for IODE would continue to receive a direct financial contribution funding from the Government of Flanders: €160,000/year between 2017 and 2020. He noted that due to expenses related to IODE-XXIV and on-going commitments the funds available for 2017 were expected to be around US\$ 125,000.

375 He mentioned that, in addition to funding provided directly to IODE, IODE is also involved in a few additional activities or projects such as SPINCAM-III and LME:Learn. While these projects do not provide direct funding to IODE, IODE is

recognized as a partner contributing to these projects. Reference was made in this regard to agenda item 3.5.2.2.

- 376 Mr Pissierssens recommended that the sessional working group on work plan and budget should take into account the expected cuts when preparing the draft work plan and budget for the next inter-sessional period.

7.3 IODE HUMAN RESOURCES

7.3.1 UNESCO Regular Programme, Extra-budgetary and seconded staff

- 377 This agenda item was introduced by Mr Peter Pissierssens. He informed the Committee that the staffing of the IOC Project Office for IODE had been further increased during the past inter-sessional period and now included:

- 378 (i) Mr Peter Pissierssens, Head of Office (UNESCO position – P-5)
379 (ii) Mr Ward Appeltans, OBIS Project Manager (UNESCO position – P-3)
380 (iii) Mr Aditya Naik Kakodkar, Software developer/project manager (Project Appointment – P-2)
381 (iv) Mr Pieter Provoost, Database Manager (Project Appointment – P-2)
382 (v) Mr Mithun Gawas, Software developer (Project Appointment, P-1)
383 (vi) Ms Claudia Delgado, Training Coordinator (Seconded by VLIZ)
384 (vii) Ms Kristin de Lichtervelde, Administrative manager (Seconded by VLIZ)
385 (viii) Mr Mark Van Crombrugge, IT manager (Seconded by VLIZ)
386 (ix) Ms Lies Groen, Office assistant (Contracted through VLIZ, ½ time)

- 387 An additional “data science officer” was being recruited for OBIS (project appointment, P-1) and was expected to join the Project Office in April 2017. An additional administrative assistant was also being recruited (G-3) around March 2017. This would bring the total staff number of 11.

- 388 Mr Pissierssens noted that, while the number of staff has further increased during the past inter-sessional period, all additional staff were funded through projects, all of which would end in 2018. In order to maintain these positions new projects would therefore need to be drafted and funding identified by the end of 2018. Taking into account the deteriorating financial situation of UNESCO it was highly unlikely that additional UNESCO regular programme positions could be established during the next UNESCO biennium 2018-2019.

7.3.2 Internships

- 389 This agenda item was introduced by Mr Peter Pissierssens. He reported that one internship had been provided during the inter-sessional period 2015-2017: Ms Sayaka Suda was seconded to the Project Office for a period of 3 months (November 2016- February 2017) by Japan (University of Tokyo) to assist with the population of the IOC capacity development web site.

- 390 **The Committee thanked** Japan for the secondment of an intern.

7.4 OTHER RESOURCE OPPORTUNITIES FOR 2017-2019

- 391 This agenda item was introduced by Ms Cyndy Chandler. She invited the

Committee to report or propose other resource opportunities for the next inter-sessional period.

392 [TO BE ADDED DURING SESSION]

8. PROPOSED WORK PLAN FOR THE NEXT INTER-SESSIONAL PERIOD (2017-2019)

8.1 CURRENT PROJECTS

393 This agenda item was introduced by ??, Chair of the sessional work group on work plan and budget. He/she referred to Document IOC/IODE-XXIV/8.1 which had been prepared by the Secretariat prior to the Session and based upon the current project reports as well as new proposals submitted during the Session.

394 [TO BE ADDED DURING SESSION]

ACTION: The Committee is requested to recommend the work plan and budget for the next inter-sessional period.

[Recommendation]

395

8.2 NEW INITIATIVES

396 This agenda item was introduced by ??, Chair of the sessional work group on work plan and budget. Under this agenda item any unforeseen expert travel (e.g. to participate in international conferences to promote IODE) will be briefly discussed for inclusion in the work plan and budget. Costing should be reported in advance (not later than Tuesday 28 March to the Chair of the sessional working group on work plan and budget).

397 [TO BE ADDED DURING SESSION]

398

ACTION: The Committee is requested to recommend the work plan and budget for the next inter-sessional period.

9. ANY OTHER BUSINESS

399 This agenda item was introduced by Mr Yutaka Michida, Co-Chair. He referred to items identified under agenda item 2.1

9.1 Research Vessel Cruise catalogue systems

400 This agenda item was introduced by Ms Cyndy Chandler, Co-Chair.

401 The Committee recalled that during the late 1960s IODE started the system of the National Oceanographic Programmes (NOPs) and Cruise Summary Reports (CSRs, formerly ROSCOPs) as a way to share information on planned research cruises as well as to report on the results of research cruises. For many years the NOP information was managed by the IODE Secretariat. However, at IODE-XV

(1995) an offer was made by the University of Delaware to take on this task as part of OCEANIC (www.cms.udel.edu). The IODE Committee accepted this kind offer and Oceanic managed the service for well over ten years. At IODE-XVI, IODE decided to cease the mailing of paper copies of NOPs by the Secretariat, requested NODCs to mail NOPs directly to OCEANIC (<http://www.researchvessels.org>) , and recommended that NOP information be made available on-line through OCEANIC. OCEANIC has continued this function, but has found it increasingly difficult to fund this activity in recent years.

402 More recently other similar services have been established. Some are national while others are regional or international, for example: (i) POGO's Ocean-going research vessel cruise programmes (<http://www.pogo-oceancruises.org/content/content.asp?pageid=2>) is global; (ii) the Rolling Deck to Repository Cruise Catalog (<http://www.rvdata.us/search>) covers the US academic fleet; and (iii) JCOMMOPS Cruises (<http://www.jcommops.org>) now hosts a cruise directory database as well.

403 While the same research vessel is included in several databases it is often unclear whether they are systematically covered or not.

404 The Committee may wish to consider identifying one or more "sources of choice" for research vessel information.

ACTION: The Committee is requested to recommend further action

405

10. DATE AND PLACE OF THE NEXT SESSION

406 Ms Cyndy Chandler, IODE Co-Chair invited the Committee to discuss the date and venue of the twenty-fifth Session. The Committee was invited to consider holding the meeting during the month of March 2019, taking into consideration the need to report to the IOC Assembly in June 2019.

407 The Committee was further informed that, as result of terrorist attacks carried out in various regions around the world in 2015 and 2016, new security regulations had been adopted by the United Nations in August 2016. These made timely planning and preparations of meetings such as the IODE Committee Meeting essential. Countries that would be prepared to host the next Session were therefore kindly requested to inform the IODE Secretariat of their intention to host, not later than 12 months before the next Session dates, i.e. March 2018. Full information on the in-kind contributions expected from a Host were available upon request from the IODE Secretariat.

408 [TO BE ADDED DURING SESSION]

11. ELECTION OF THE CO-CHAIRS

409 The IODE Technical Secretary introduced this item by referring to the IOC Rules of Procedure (Document IOC/INF-1166), and more particularly to Rule 25, para 3. The Technical Secretary informed the Committee that, in accordance with the above Rules, the current two Co-Chairs (Ms Cyndy Chandler and Prof Yutaka Michida) had completed one term and could be invited to continue for a second term of two years.

410

ACTION: The Committee is requested to consider re-electing the Co-Chairs for a second term

12. ADOPTION OF THE SUMMARY REPORT

411 This Agenda Item was introduced by both Co-Chairs. The Committee was invited to adopt the draft Summary Report of the Session, and the Resolutions and Recommendations.

412 The Committee considered requesting its Co-Chairs and the IOC Secretariat to make editorial corrections as necessary, taking into account the discussions held during the session.

413 The Committee considered requesting the IODE Co-Chairs to present the Executive Summary with all Resolutions and Recommendations therein to the Twenty-Ninth Session of the IOC Assembly that would take place in June 2017 at the UNESCO headquarters in Paris, France.

13. CLOSURE

414 The Co-Chairs addressed the Committee and closed the Session on Friday 31 March 2017 at **[TO BE ADDED DURING THE SESSION]...**

415 ...

DRAFT RECOMMENDATIONS AND RESOLUTIONS

This document does not include draft decisions and draft recommendations.

A Decision is a determination to act that is binding upon the body adopting it, and that body only; a Decision by a subsidiary body may be subject to qualification by the parent body or the Governing Bodies.

A Recommendation is normally made to the parent body; if the Recommendation is intended for the IOC Assembly or Executive Council, or, if appropriate, for concerned bodies or other organizations collaborating with the Commission, or to Member States, it rests with the parent body or its Chairperson to relay the Recommendation to the Executive Secretary for submission to the entity for which it was intended.

The IODE Session will establish a Decision/Recommendation committee. This committee will review all draft decisions/recommendations with their authors before distribution to all Committee members for adoption (under agenda item 15).

RECOMMENDATION IODE-XXIII.[a.b.c.d]

TITLE

The IOC Committee on International Oceanographic Data and Information Exchange,

Recalling,

Recalling further

Noting,

Recommends:

Draft recommendations and decisions should be prepared prior to the Session so the recommendation/decision committee (which will meet during the Session and review all draft decisions and recommendation) can carry out its task in the most effective way.

DRAFT RECOMMENDATION IODE-XXIII.6.1.1

ASSOCIATED INFORMATION UNITS (AIUs)

The IOC Committee on International Oceanographic Data and Information Exchange,

Acknowledging the success of the IODE Associated Data Units (ADU) as key partners in realizing the IODE objectives,

Noting the importance of including the wider ocean information community as key stakeholders of the IODE,

Noting further the growth of ocean research and observation programmes and projects, and the necessity for these projects to establish data and information models,

Stressing the need to share, provide discovery and access to and to preserve all ocean research and observation information,

Noting the importance of standardization and interoperability of data and information systems across the ocean research and observation communities,

Recalling that IODE presently has no direct communication with individual marine science libraries and information centres resulting in minimal engagement,

Recommends the establishment of IODE Associate Information Units (AIUs) as a structural element of IODE with the following Terms of Reference:

IODE Associate Information Units (AIUs) shall:

- (i) Be national projects, programmes, institutions or organizations, or regional or international projects, programmes, institutions or organizations (including academia) that carry out marine information management functions,
- (ii) Be staffed by at least one marine information professional (by qualification or experience)
- (iii) Receive information on, and contribute to, IODE standards and best practices related to marine information management,
- (iv) Be welcomed to participate in ocean data and information management training, organized within the framework of the IODE OceanTeacher Global Academy programme,
- (v) Participate in IODE workshops and projects,
- (vi) Share expertise with other AIUs,
- (vii) Be invited to share new digital initiatives implemented within the AIUs
- (viii) Provide advice and where appropriate become an IODE Project member
- (ix) Receive assistance, upon request, from IODE, on matters related to marine information management,
- (x) Closely link with the IODE National Coordinator for Marine Information Management if existing
- (xi) Agree to display IODE logo on appropriate marine information output
- (xii) Agree to make available information management documentation (standards, practices, guides,...) used by the AIU for the wider marine science library and information community,

Invites any marine science related project, programme, institution or organization that is willing to comply with the above-mentioned Terms of Reference to apply to join IODE as an IODE Associate Information Unit (AIU) by providing the following information:

- (i) name and contact information of the AIU contact point(s);
- (ii) name and contact point of the head of the applicant entity;
- (iii) description of the national, regional or international project, programme, institution or organization;
- (iv) brief description of information services/products/digital initiatives provided by the entity;
- (v) description of staff and skills/expertise;
- (vi) metrics on budget and collections;
- (vii) for projects: expected lifespan of the project and indication of plan for the archival/preservation of the information output;
- (viii) letters of support;
- (ix) required capacity building, training that IODE could contribute;
- (x) of the existing relationship with a IODE.

Invites IOC Member States to actively promote AIU membership

Recommends that applications for AIUs shall be reviewed by the IODE Officers (by email or during IODE Officer meetings) in consultation with the Joint IODE/IAMSLIC Group of Experts on Marine Information Management.

Recommends further the revision of the structural elements of IODE to include: Associated Information Units (AIUs)

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